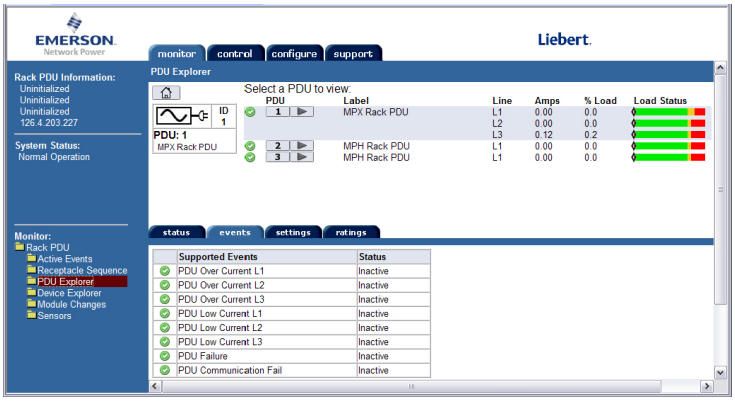
Infrastructure Management & Monitoring
For *Business-Critical Continuity™*

Liebert® RPC™ Web Card

User Manual - Network Interface card for the Liebert Rack PDU family of power distribution products



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TECHNICAL SUPPORT

How Do You Contact Emerson Network Power® for Technical Support?

For help on setting up the Liebert RPC or any other monitoring product, contact Emerson's Software Technical Applications Support Center at:

UNITED STATES	1 800 222 5877
FRANCE	+33 (0) 1 46 87 51 52
GERMANY	+49 (0) 89 99 19 220
ITALY	+39 02 98250222
NETHERLANDS	+31 (0) 475 503333
UNITED KINGDOM	+44 1628403200
EUROPE	+800 11554499
ASIA	+800 11554499
AUSTRALIA	1 800 147704
NEW ZEALAND	0 800 447415
WORLDWIDE	1 614 841 6755
	FAX: 1 740 833 8631
	All Products: **http://www.liebert.com**
	E-mail: **liebert.monitoring@emerson.com**

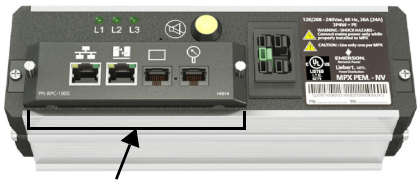
1.0 INTRODUCTION

The Liebert RPC (Rack PDU Card) is a network interface card that provides network connectivity to the Liebert Rack PDU family of products.

The Liebert RPC can be installed in Adaptive (Liebert MPX™) and Managed (Liebert MPH™) versions of Liebert Rack PDUs to provide network monitoring and control capabilities.

In addition, the Liebert RPC serves as the integration point for several rack accessory products. Available options include a handheld display to view monitoring data and Liebert SN™ sensors that may be connected to monitor temperature, humidity, door contacts and digital inputs.

Figure 1 Liebert RPC installed in Rack PDUs



Liebert RPC installed in a Liebert MPX

Liebert RPC installed in a Liebert MPH

1.1 Ports on the Liebert RPC

Figure 2 shows the four individual ports on the Liebert RPC.

Each port is designed for only one type of connection. See **Table 1** for descriptions and references to sections with details on using these ports.

Figure 2 Liebert RPC ports

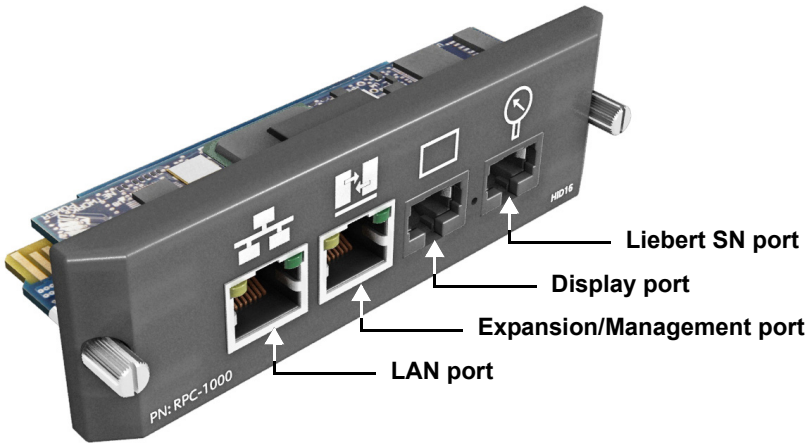
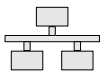


Table 1 Liebert RPC port icons

Icon	Name	Purpose	For details, refer to Section:
	LAN Port	Use this port **ONLY** for: • Plug in the Local Area Network (LAN) via an Ethernet cable (not included). • Creating a Rack PDU Array™ by interconnecting additional Rack PDUs	**4.0 - Liebert RPC Installation** **1.3 - Interconnecting Rack PDUs to Create a Rack PDU Array™**
	Expansion/ Management Port	Use this port **ONLY** for: • Local configuration through interconnection to a computer • Creating a Rack PDU Array by interconnecting additional Rack PDUs	**4.0 - Liebert RPC Installation** **1.3 - Interconnecting Rack PDUs to Create a Rack PDU Array™**
	Display Port	Use this port **ONLY** to plug in the RPC BDM (Basic Display Module).	**11.2 - RPC BDM™ Installation**
	Liebert SN Port	Use this port **ONLY** to plug in optional sensor accessories.	**12.0 - Liebert SN™ Sensor Installation (Optional)**

1.2 The Liebert MPX™ and Liebert MPH™ Rack PDUs—Overview

The Liebert MPX and Liebert MPH Rack PDUs are single-phase or three-phase power distribution products that offer monitoring and receptacle-level control.

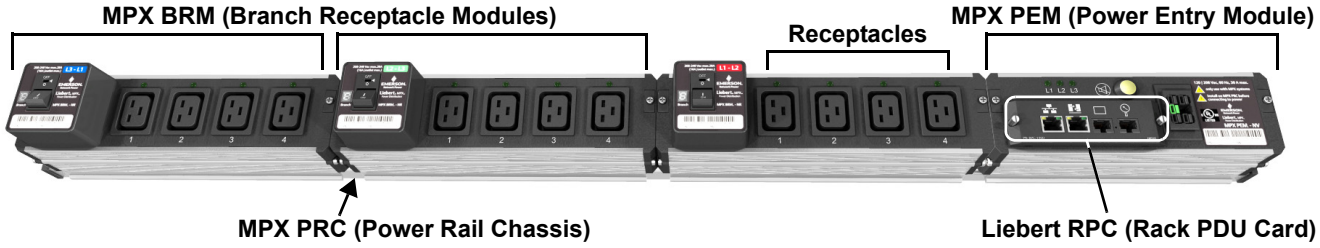
1.2.1 Liebert MPX

The Liebert MPX is an Adaptive Rack PDU (power distribution unit) built with modular and scalable components that can be installed and reconfigured on-site to meet varying input and output power connectivity needs. The Liebert MPX Adaptive Rack PDU family consists of the following components:

- MPX PRC™—(Power Rail Chassis) distributes intermodule power, communications and serves as the mounting base for all Liebert MPX components.
- MPX PEM™—(Power Entry Module) delivers power to the Liebert MPX and includes provisions for remote and local communication options. Detachable and fixed-input cord versions are available.
- MPX IPC™—(Input Power Cord) is a detachable input power cord required for some versions of MPX PEM. A variety of single- and three-phase plug types are available.
- MPX BRM™—(Branch Receptacle Module) distributes overload-protected output power to user loads. Hot swappable design allows for reconfiguration with choice of receptacle type, quantities, and monitoring / control to the receptacle level.
- Liebert RPC—(Rack PDU Card) optional network interface card to manage and monitor power distribution to connected equipment; installs in a communication card slot. Allows for multiple Liebert MPX and Liebert MPH Rack PDUs to be interconnected and managed from a single network connection.
- RPC BDM™—(Basic Display Module) optional LCD for local monitoring of Liebert MPX units. Cord-connected, allowing user to select rack mounting location. Enables local management via the RPC BDM option and environmental sensing options.

Figure 3 shows where to install a Liebert RPC into the MPX PEM™ (Power Entry Module) on the Liebert MPX. Once installed, the branch receptacle modules and receptacles can be managed by the Liebert RP™.

Figure 3 Liebert MPX and system component descriptions


MPX BRM (Branch Receptacle Modules)
Receptacles
MPX PEM (Power Entry Module)
MPX PRC (Power Rail Chassis)
Liebert RPC (Rack PDU Card)

1.2.2 Liebert MPH

The Liebert MPH is a single unit with fixed capacity, input and output. The Liebert RPC is factory-installed in the Liebert MPH.

Figure 4 shows where the Liebert RPC is installed in the Liebert MPH.

Figure 4 Liebert MPH and system component descriptions

1.3 Interconnecting Rack PDUs to Create a Rack PDU Array™

Up to four Liebert Rack PDUs—each equipped with a Liebert RPC—can be interconnected to create a Rack PDU Array to allow monitoring of all components through a single interface.

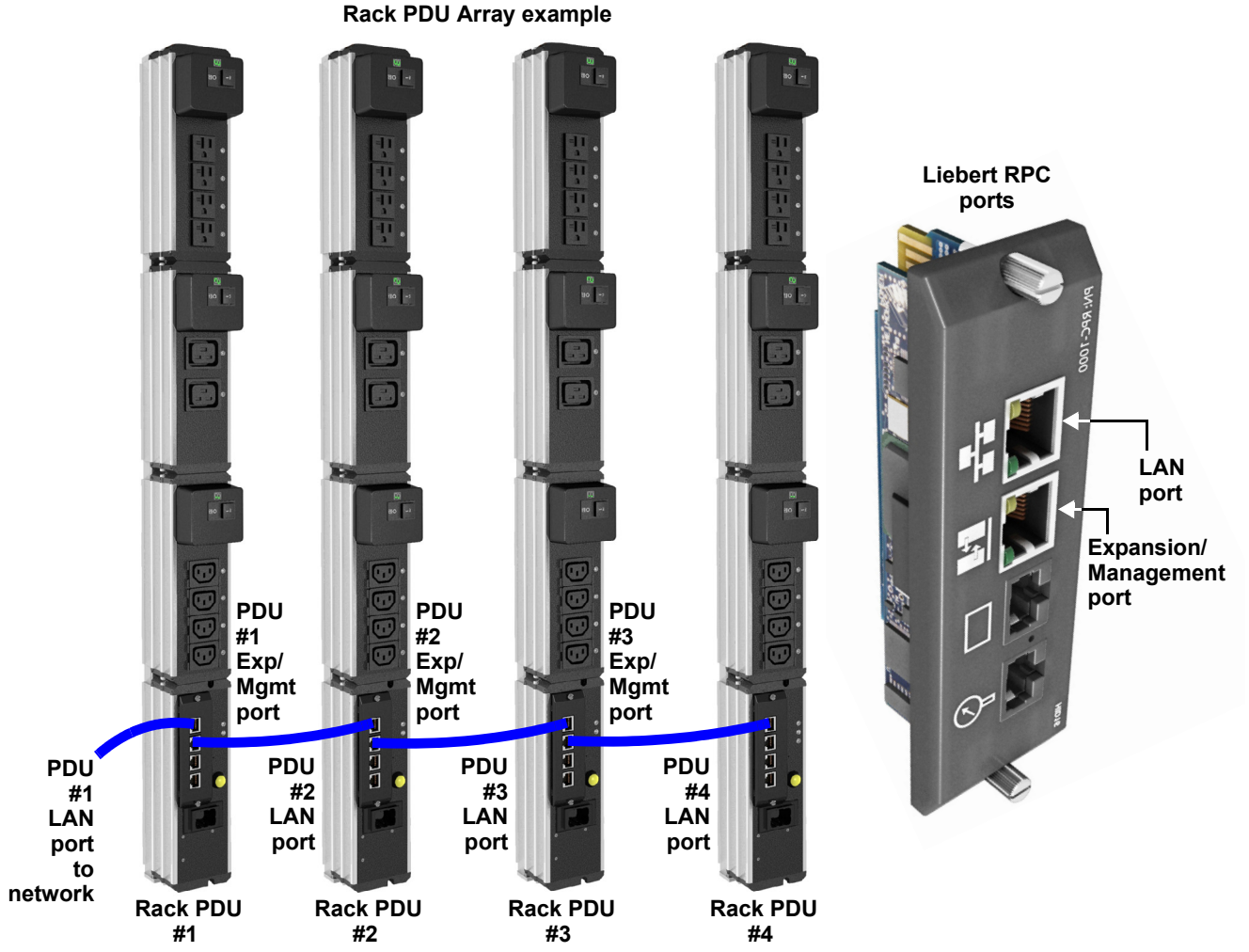
Figure 5 shows an example of a Rack PDU Array of Liebert MPX™ units. The Rack PDU Array may consist of a mix of Liebert MPX and Liebert MPH™ units.

1.3.1 Steps for Rack PDU Array Assembly

To assemble the Rack PDU Array:

1. Refer to **4.0 - Liebert RPC Installation** to connect and configure the first Rack PDU. This remains PDU #1 unless changed in **Step 2** below. (Each PDU is factory-configured as PDU #1.)
2. Refer to **9.10 - Rack PDU Array** for details on individually connecting each additional Rack PDU to a computer and assigning a new PDU number—2, 3 or 4. This must be completed for each Rack PDU before proceeding to **Step 3** below.
3. Interconnect the Rack PDUs with standard Ethernet cables as follows (see **Figure 5**) for up to four Rack PDUs:
   a. Connect the Expansion/Management port in Rack PDU #1 to the LAN port in Rack PDU #2.
   b. Connect the Expansion/Management port in Rack PDU #2 to the LAN port in Rack PDU #3.
   c. Connect the Expansion/Management port in Rack PDU #3 to the LAN port in Rack PDU #4.
4. Use the LAN port in Rack PDU #1—the only Rack PDU with an open LAN port—to connect the Rack PDU Array to the network.

Figure 5 Example of a Rack PDU Array



2.0 LIEBERT RPC CAPABILITIES AND BENEFITS

The Liebert RPC offers the following capabilities and benefits:

Table 2 Liebert RPC capabilities and benefits

Capability	Benefit
Interoperability	The Liebert RPC integrates network management of the Liebert family of Rack PDUs and environmental sensors with a local display interface. This ensures consistency of information available to both remote and local users—those in the data center—thus reducing mistakes during commission/decommission.
Cable Standardization	The Liebert RPC uses only standard Ethernet cables that are readily available in a data center; no special cables are required.
Consolidation of IP Addresses	The Liebert RPC can be used to create a Rack PDU Array by interconnecting multiple Liebert Rack PDUs within the rack to minimize the number of IP addresses and reduce required overhead.
Receptacle Group Control	The Liebert RPC enables monitoring and management of receptacle groups through Liebert Nform™ software.
Liebert Rack PDU Power Condition Monitoring	The Liebert RPC enables monitoring of Rack PDU receptacle voltage and current draw, provides load balancing capability and monitors rack environmental conditions.
Energy Metering	The Liebert RPC calculates power consumption (kWH) at the PDU, branch and receptacle levels on some PDUs.
Receptacle Load Control	The Liebert RPC controls the power-up / wake-up state and sequencing of receptacles.
Local Display Support	The Liebert RPC provides an interface for a display option to facilitate installation and local troubleshooting of interconnected Liebert Rack PDUs. The display may be user-mounted for optimal placement and viewing.
Event Notifications	The Liebert RPC sends comprehensive event notifications via SNMP, e-mail, SMS text messages and pages. It also provides notification status via a Web page.
Load Centric Rack PDU Management	The Liebert RPC allows the user to interact with the PDU by referencing the user-assigned receptacle labels or loads.
Similar User Interface With Other Liebert Products	Through the use of the Liebert RPC, the operation and management of the Rack PDU product family is consistent with that of other Liebert Web-enabled products.
Wide Range of IT Network Capabilities	The Liebert RPC provides a flexible set of IT networking capabilities, including DHCP, BOOTP, DNS, SNTP and SNMP (v1, v2c and v3).
Hot-Swappable	The Liebert RPC can be removed and reinserted without removing power from the PDU or affecting the connected load.
Flash Upgradable Firmware	The Liebert RPC enables the user to easily update the firmware as new features and capabilities become available.

2.1 Web Support

The Liebert RPC delivers Web management and control to Liebert Rack PDU equipment. All authorized users will be able to view status information on their network.

2.2 SNMP Support

The Liebert RPC enables SNMP management of Liebert Rack PDU equipment. To integrate the card into an SNMP implementation, compile the Liebert Global Products MIB on your Network Management System (NMS).

The Liebert Global Products MIB can be downloaded from:

www.liebert.com

2.3 Liebert Nform™

Utilizing the SNMP and Web technologies built into the Liebert RPC, Liebert Nform will centrally manage event notifications, access critical system information and manage the power delivered to your critical devices.

A downloadable edition is available online at:

nform.liebert.com

2.4 Liebert SiteScan® Web

The Liebert RPC integrates with Liebert SiteScan Web software to monitor and analyze trends to ensure high-availability operation of critical facilities.

For more information on Liebert SiteScan Web, visit the Web page at:

sitescan.liebert.com

3.0 LIEBERT RPC KIT

3.1 Liebert RPC Kit Contents

The Liebert RPC kit includes these items:

- Liebert RPC communication card
- Quick-Start Guide, containing card installation and configuration instructions (see **4.1 - Install the Card** and **4.2 - Configure the Card**)
- This user manual, downloadable from the Web at **www.liebert.com**

3.2 Cables Required for Installation (not included)

The following items are not included, but are necessary for Liebert RPC functionality:

- Two Ethernet cables:
  - LAN connection cable
  - Expansion connection cable (if applicable)

3.3 Liebert RPC Installation Requirements

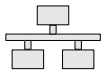
To begin installation, proceed to Sections **4.1** and **4.2** for the installation and configuration instructions from the quick-start guide included in the kit.

4.0 LIEBERT RPC INSTALLATION

4.1 Install the Card

Locate the communication card bay on your Liebert Rack PDU—You might need to remove a cover.

- Insert the Liebert RPC (Rack PDU Card) into the card bay, then secure it with the provided screws.
- The card has four ports designated by icons. Connect a Local Area Network Ethernet cable (not included) to the LAN port, identified by the icon shown at right.



LAN port icon

4.2 Configure the Card

NOTE: The card is factory-set for DHCP. If you require a Static or BootP network configuration, be sure to change the Boot Mode, as described below.

1. Insert an additional Ethernet cable (not included) into the card's Expansion/ Management port (see icon at right).

Expansion/ Management port icon

CAUTION

The card's Expansion/Management Port should be used **ONLY** for local configuration through interconnection to a laptop.

Do not connect the cable from the Expansion/Management port to your company LAN.

2. Insert the other end of the Ethernet cable into a laptop.
3. Configure the laptop's IP settings to communicate on a 192.168.1.X network:

IP address	192.168.1.9
Subnet mask	255.255.255.252
Default gateway	192.168.1.1

4. Open a Web browser, enter the IP address of the Expansion/Management Port, then press Enter.
   - For a single Rack PDU or Rack PDU #1 in a Rack PDU Array, enter **http://192.168.1.10**.
   - Each PDU is factory-configured as PDU #1. This requires assigning a new number to specify the position of each additional Rack PDU in a Rack PDU Array and rebooting the card (see **9.10 - Rack PDU Array**). This process automatically assigns the IP addresses and subnet masks shown in **Table 3** for Rack PDU #2, 3 and 4.

Table 3 IP addresses in a Rack PDU Array

IP Address	Position in Rack PDU Array			
	Rack PDU #1	Rack PDU #2	Rack PDU #3	Rack PDU #4
Expansion/Management Port	192.168.1.10	192.168.1.6	192.168.1.2	192.168.1.14
LAN Port	User-configured	192.168.1.9	192.168.1.5	192.168.1.1
Subnet Mask	255.255.255.252	255.255.255.252	255.255.255.252	255.255.255.252

5. Click the **Configure** tab, then click **Network Settings** at left.
6. When prompted for a user name and password, enter **Liebert** for both (case-sensitive). Click **OK**, then read the message in the next window.
7. Click **Edit** in the right pane.
   - The default Speed/Duplex for the Ethernet port is **Auto** (automatic). To change this, choose from the Speed/Duplex drop-down list.
   - Choose the Boot Mode: **Static** or **BootP**. (The default is **DHCP**.)
8. Click **Save** to save any changes (or **Reset** to cancel). A Notice window displays a reminder to reinitialize the card. Click **OK**.
9. Make other changes as needed in the **Configure** tab (see **9.0 - Configure Tab Options and Operations** for more information).
10. To complete the configuration, click **Restart** in the left pane, then click the **Restart** button in the right pane to commit the changes and reboot the card.

11. After the Rack PDU Array is configured as shown in **Table 3**, use **Table 4** to make changes to the cards in the array using the Expansion/Management Port. **Table 4** details the laptop IP settings to use with the corresponding Rack PDU Card IP addresses.

Table 4 Laptop IP settings for Liebert RPC addresses

IP Address	Position in Rack PDU Array			
	Rack PDU #1	Rack PDU #2	Rack PDU #3	Rack PDU #4
Laptop Computer	192.168.1.9	192.168.1.5	192.168.1.1	192.168.1.13
Expansion/Management Port	192.168.1.10	192.168.1.6	192.168.1.2	192.168.1.14
Subnet Mask	255.255.255.252	255.255.255.252	255.255.255.252	255.255.255.252

5.0 MONITORING AND CONFIGURATION OVERVIEW

5.1 Liebert Rack PDU Monitoring Structure

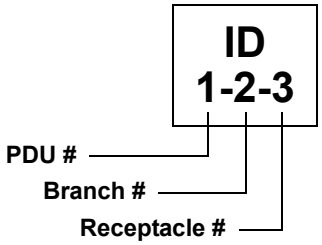
Liebert Rack PDUs are managed at three levels:

- **Rack PDU Level** - provides aggregate input power monitoring of Rack PDUs
- **Branch Level** - provides status information of a branch circuit breaker and aggregate power monitoring of branch receptacles
- **Receptacle Level** - provides status information and power monitoring of a single receptacle (available only on the Liebert MPX™)

5.2 Rack PDU Component ID

A numeric ID consisting of up to three parts helps users identify components when displayed on the Web interface or the RPC BDM display unit (see **5.3 - Liebert Rack PDU Viewing and Browsing**).

The component ID uses the format ***PDU# - Branch# - Receptacle#***. As the following example shows, the component ID ***1-2-3*** identifies ***Receptacle #3 on Branch #2 of PDU #1***.



- A **PDU** is identified by a number designating its interconnected position, from 1 to 4. Up to four PDUs can be interconnected.

  For example, "**1**" indicates ***PDU #1***.
- A **branch** is identified by the PDU where it is attached (for example, PDU #1), followed by a numeric designation of the branch's location on the PDU.

  For example, "**1-2**" indicates ***Branch #2 on PDU #1***.
- A **receptacle** is identified by the PDU and branch where it is attached (for example, PDU #1, Branch #2), followed by a numeric designation of the receptacle's location on the branch.

  For example, "**1-2-3**" indicates ***Receptacle #3 on Branch #2 of PDU #1***.

5.3 Liebert Rack PDU Viewing and Browsing

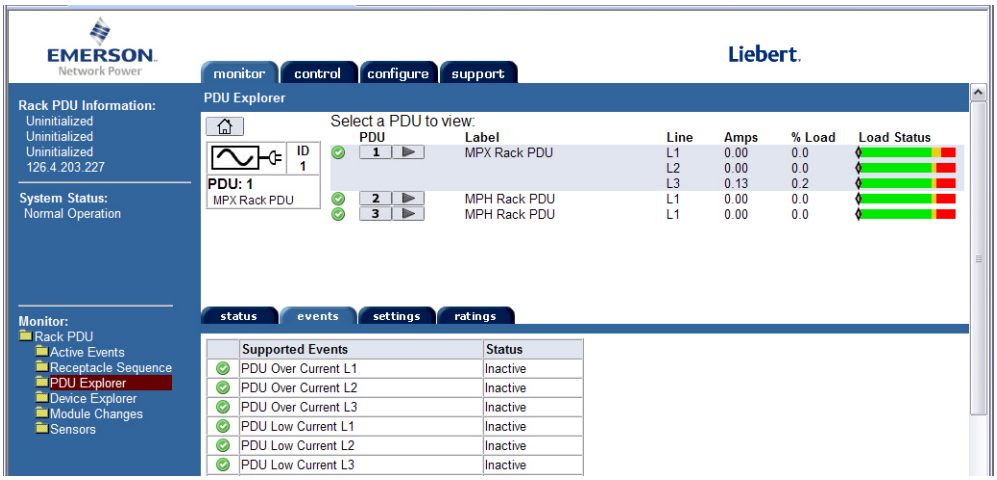
This manual covers the following methods of viewing and browsing information on a Liebert Rack PDU. Control functions are available via the Web interface but not the RPC BDM.

Method	Monitoring	Control	For details, refer to:
PDU Explorer™			
• Web interface	✔	✔	**5.3.1 - PDU Explorer** (Overview) **7.3 - Monitor Tab: PDU Explorer - Overview** **8.2 - Liebert Rack PDU Control Operations**
• RPC BDM display unit	✔	—	**5.3.3 - RPC BDM** (Overview) **11.0 - RPC BDM™ (Optional)**
Device Explorer™			
• Web interface	✔	✔	**5.3.2 - Device Explorer** (Overview) **7.4 - Monitor Tab: Device Explorer - Overview** **8.2 - Liebert Rack PDU Control Operations**
• RPC BDM display unit	✔	—	**5.3.3 - RPC BDM** (Overview) **11.0 - RPC BDM™ (Optional)**

5.3.1 PDU Explorer

PDU Explorer is Web-based software that displays a hierarchical view of the system. Using PDU Explorer, the user is able to browse components starting at the PDU level, through to the branches of the PDU, and down to the receptacles of those branches. See **6.0 - Browsing PDU Information on the Web Interface** for details on using PDU Explorer.

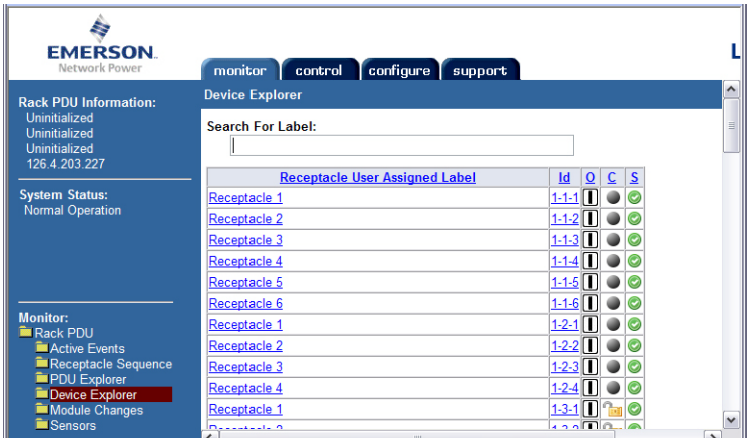
Figure 6 The PDU Explorer home screen



5.3.2 Device Explorer

Device Explorer is Web-based software that displays the user-assigned labels (names) of each receptacle to provide a load-centric method to access status and metering information about the associated load or connected device. To view information on a specific PDU, see **6.0 - Browsing PDU Information on the Web Interface** for detailed information on using Device Explorer.

Figure 7 The Device Explorer screen



5.3.3 RPC BDM

The RPC BDM display allows the user to locally view PDU, branch and receptacle information. See **11.0 - RPC BDM™ (Optional)** for a detailed description of its functions.

Figure 8 RPC BDM displaying receptacle information

6.0 BROWSING PDU INFORMATION ON THE WEB INTERFACE

A Web interface allows users to view information at the PDU, branch and receptacle levels in real time.

6.1 Understanding Icons

Table 5 shows the icons displayed in the Web interface to aid users in:

- Navigating between views
- Identifying which component is displayed
- Viewing status information

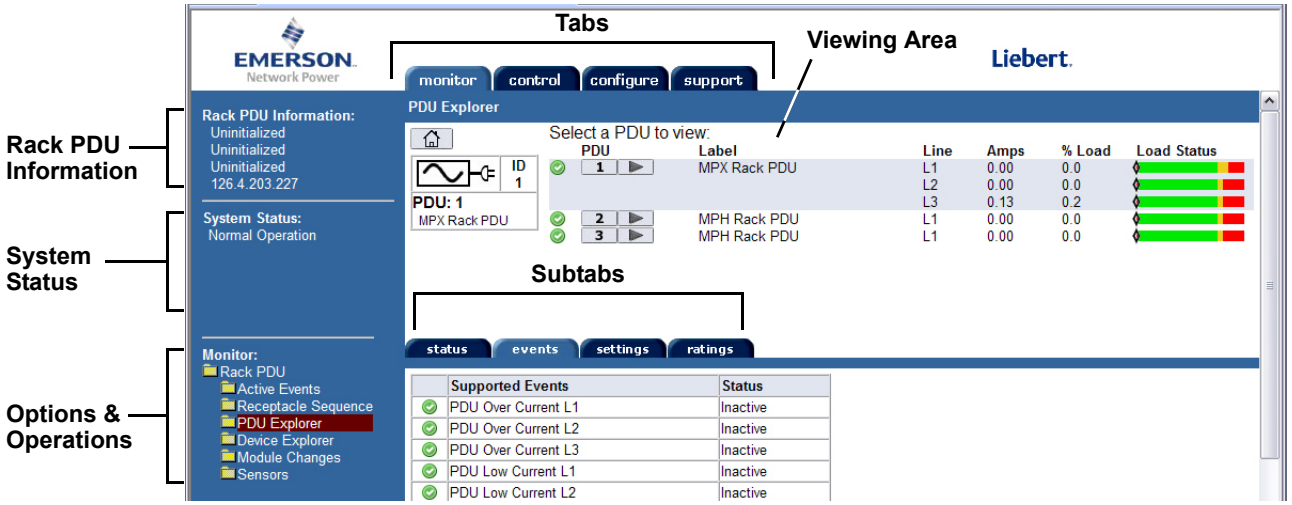
Table 5 Liebert RPC Icons

Icon	Description
Navigation	
	Navigate to the Home Page of the PDU Explorer.
	Navigate up one level in the PDU Explorer—from receptacle to branch or from branch to PDU.
	Navigate down one level in the PDU Explorer—from PDU to branch or from branch to receptacle.
Component Identification	
	A PDU—a Liebert MPX™ or Liebert MPH™
	A branch of a PDU.
	A receptacle on a branch.
	A Liebert SN™ sensor connected to the PDU.
	Component ID of the selected module in the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID**. For example, *1-2-3* identifies *PDU 1, Branch 2, Receptacle 3*.
Component Status Indicators	
	Locked: Receptacle operation is locked, meaning that no receptacle settings can be changed.
	Unlocked: Receptacle operation is unlocked, allowing changes to receptacle settings.
	No Control: The receptacle is not communicating with the Rack PDU.
	Normal: The component is operating normally.
	Warning: The component has an active warning.
	Alarm: The component has an active alarm.
	On: The receptacle is On.
	Off: The receptacle is Off.

6.2 Web Page Layout Overview

This section provides a quick look at the layout of the PDU Web interface pages.

Figure 9 Web Page Layout overview



6.2.1 Web Page Sections

The left side of the Web page is organized into these sections:

- **Rack PDU Information** - The top portion of the left pane displays the configured name, location and IP address of the PDU for identification purposes.
- **System Status** - The center section at left displays the current status of the PDU and is updated dynamically. If the status is not Normal, additional messages may appear.
- **Options and Operations** - The bottom left section lists available options and operations, depending on which tab is selected at the top of the Web page, described in the next section, **6.2.2 - Web Page Tabs**.
- **Viewing Area** - The viewing area at right varies according to items selected from the Options and Operations section in the left pane.

6.2.2 Web Page Tabs

Tabs appear at the top of the Web page, as shown in **Figure 9**. Clicking on a tab changes the display of available options in the bottom left pane.

- **Monitor Tab** - provides read-only access to view status, alarms, settings and ratings of configured PDUs, branches and receptacles (see **7.0 - Monitor Tab Options and Operations**).

NOTE

The Monitor tab allows data viewing only; PDU control functions can be performed by clicking the Control tab, described below.

- **Control Tab** - provides password-protected access to control options and operations available for the PDU, such as naming components and turning receptacles on or off (see **8.0 - Control Tab Options and Operations**).
- **Configure Tab** - provides password-protected access to configuration options including system and network settings, messaging and firmware updates (see **9.0 - Configure Tab Options and Operations**).
- **Support Tab** - displays identifying information for the Liebert RPC card, as well as events and parameters available for the Liebert equipment (see **10.0 - Support Tab Options and Operations**).

Subtabs may appear at the bottom of the right pane, depending on the selection. The example in **Figure 9** shows four subtabs that appear after selecting the Monitor tab at top, then PDU Explorer in the left pane.

7.0 MONITOR TAB OPTIONS AND OPERATIONS

The Monitor tab allows read-only access to PDU data, permitting users to view status, active events, settings and ratings of configured PDUs, branches and receptacles.

The following options are available in the Options and Operations section when the Monitor tab is selected. (The Control and Configure tabs provide ways to perform control functions and make changes.)

7.1 Monitor Tab: Active Events *(View Only)*

Use this option to view a list of all active events on the PDU with severity and other data.

- Click on the **Monitor** tab at the top of the window.
- Click on **Active Events** in the left pane to display the status of all active events on the PDU.
- If any active events are detected:
  - Alert messages appear in the left pane in the System Status section, as shown below.
  - The viewing area in the right pane displays the type of data shown below and described in **Table 6**. An icon indicates the severity of the condition (see **6.1 - Understanding Icons**), and other information identifies the source and type of event.
- If no active events are detected, the message **No Alarms Present** appears in the right pane.

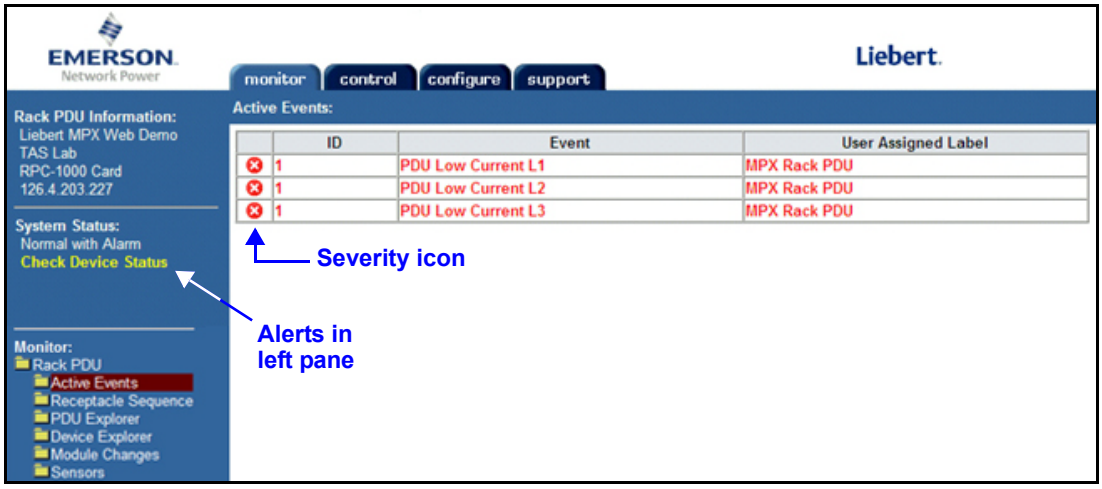


Table 6 Monitor tab: Active Events elements

Element	Description
Severity	Displays the icon representing the event severity. See **6.1 - Understanding Icons**.
ID	Displays the ID of the component with the active event (using the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID**) or other identifying information about where the condition occurred.
Event	Displays a description of the condition.
User-Assigned Label	Displays the name of the device with the active event.

7.2 Monitor Tab: Receptacle Sequence *(View Only)*

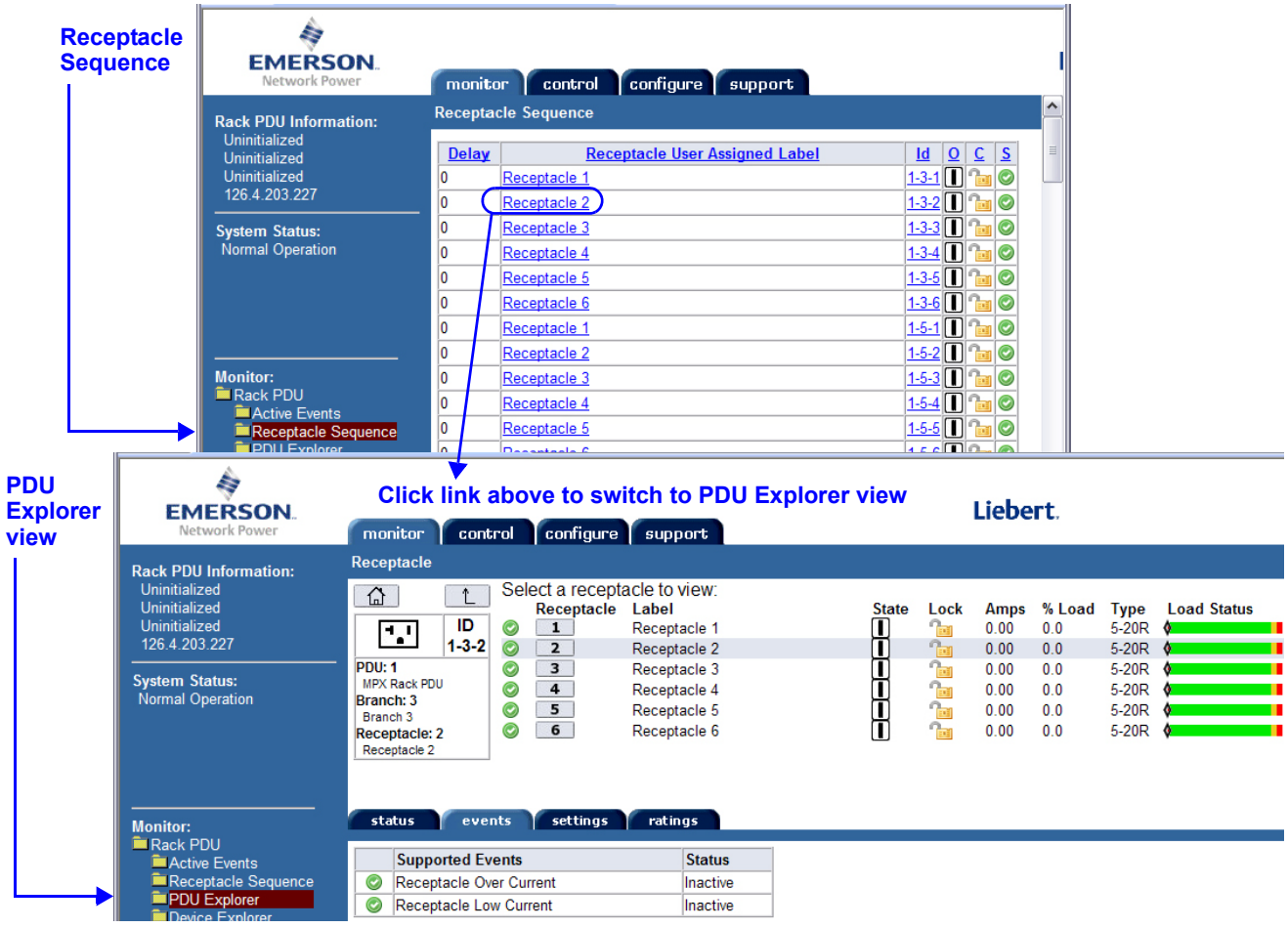
Use this option to view a list of all receptacles on a PDU with power-up sequence and other data. (To perform control functions, see **8.1 - Control Tab: Receptacle Sequence**.)

- Click on the **Monitor** tab at the top of the window.
- Click on **Receptacle Sequence** in the left pane to display the power-up sequence (order) of the receptacles on a specific PDU.
- The viewing area in the right pane displays the data described in **Table 7** and shown below.

Table 7 Monitor tab: Receptacle Sequence elements

Element*	Description
Delay	Displays the number of seconds that will elapse before power is applied to the receptacle upon startup of the Rack PDU.
Receptacle User-Assigned Label	Displays the user-assigned name of the receptacle—also links to the PDU Explorer.
ID	Displays the ID of the receptacle (using the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID**)—also links to the PDU Explorer.
Icons indicate the state of the receptacle (see **6.1 - Understanding Icons**):	
O (On/Off)	Icon indicates the receptacle is turned **On** or **Off**.
C (Control)	Icon indicates whether changes are allowed (**Locked**, **Unlocked** or **No Control**).
S (Status)	Icon indicates the operating condition (**Normal**, **Warning** or **Alarm**).

*** Note:** Click on an underlined heading to sort the list by entries in that column.



- To view receptacle details, click on the receptacle name or ID—these are links that open the PDU Explorer. In this example, clicking on the *Receptacle 2* link at the top opens the PDU Explorer view to display details for Receptacle 2 at the bottom.

7.3 Monitor Tab: PDU Explorer - Overview

The PDU Explorer uses a hierarchy to display data from connected equipment, starting with the PDU view at the highest level (default opening view), allowing users to browse down one level to view branches, then another to the receptacle view. The PDU Explorer may also be used to view sensor data; see **7.6 - Monitor Tab: Sensors - Overview** for details.

To access the PDU Explorer:

- Click on the **Monitor** or **Control** tab at the top of the window:
  - The **Monitor** tab permits viewing only.
  - The **Control** tab allows authorized users to perform control functions (see **8.2 - Liebert Rack PDU Control Operations** for additional information).
- Click on **PDU Explorer** in the left pane. The viewing area in the right pane displays the top-level PDU view, as shown in the example below.
- See **Table 8** for explanations of screen components that appear in the viewing area, then refer to Sections **7.3.1** - **7.3.4** for details on the Monitor subtabs available in the PDU Explorer.

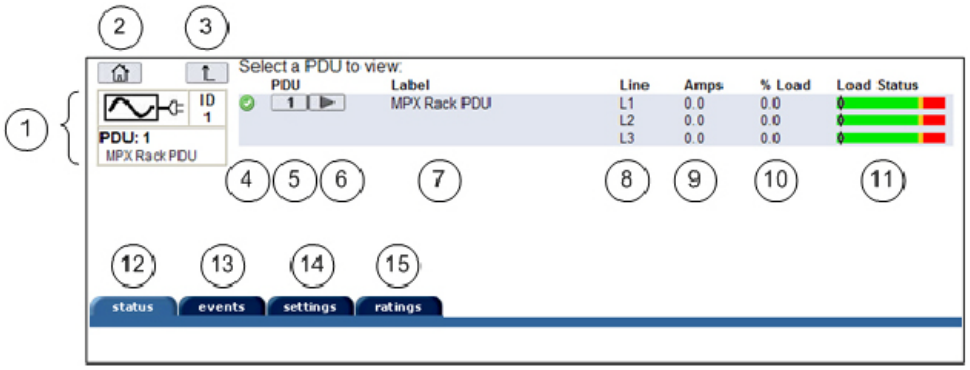
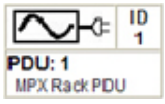
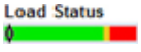


Table 8 PDU Explorer components

#	Item	Item Description	Purpose
1		Component Identification	Displays an icon to indicate the type of component selected—PDU, branch or receptacle—as well as the component ID # and user-assigned name.
2		Home Button	Go to the PDU Explorer home page.
3		Navigate Up Button	Move up one level—from receptacle to branch view, or branch to PDU view.
4		Status Icon	Displays an icon to represent the status of PDU operation—e.g., *Normal*. See **6.1 - Understanding Icons**.
5		Component ID Button	Click to select a given PDU, branch or receptacle to view its information.
6		Navigate Down Button	Click to move down one level—from PDU to branch view, or branch to receptacle view.
7	Label	User-Assigned Label	Displays the name given to the component by a user.
8	Line	Power Line Designator	Displays the label of the currently viewed input line.
9	Amps	Line Amperage	Displays the amperage of the receptacle.
10	% Load	Line Percent Load	Displays the percentage of total PDU load currently being used.
11		Load Status Graph	Graphically displays the line percent load value relative to configured thresholds for low and high current levels for the selected PDU, branch or receptacle.
12	Status	PDU Explorer Subtab	View information on the status of the selected component.
13	Events	PDU Explorer Subtab	View information on the status of supported events.
14	Settings	PDU Explorer Subtab	View selected component's thresholds and identifiers that can be configured.
15	Ratings	PDU Explorer Subtab	View the selected component's rating.

7.3.1 Monitor Tab: PDU Explorer - Status Subtab

The **Status** subtab displays the current measurement data of the selected component.

- Click on the **Monitor** tab at the top of the window.
- Click on **PDU Explorer** in the left pane.
- Select the PDU or other component in the right pane.
- Click on the **Status** subtab. The viewing area in the right pane displays the data shown below and described in **Table 9**.

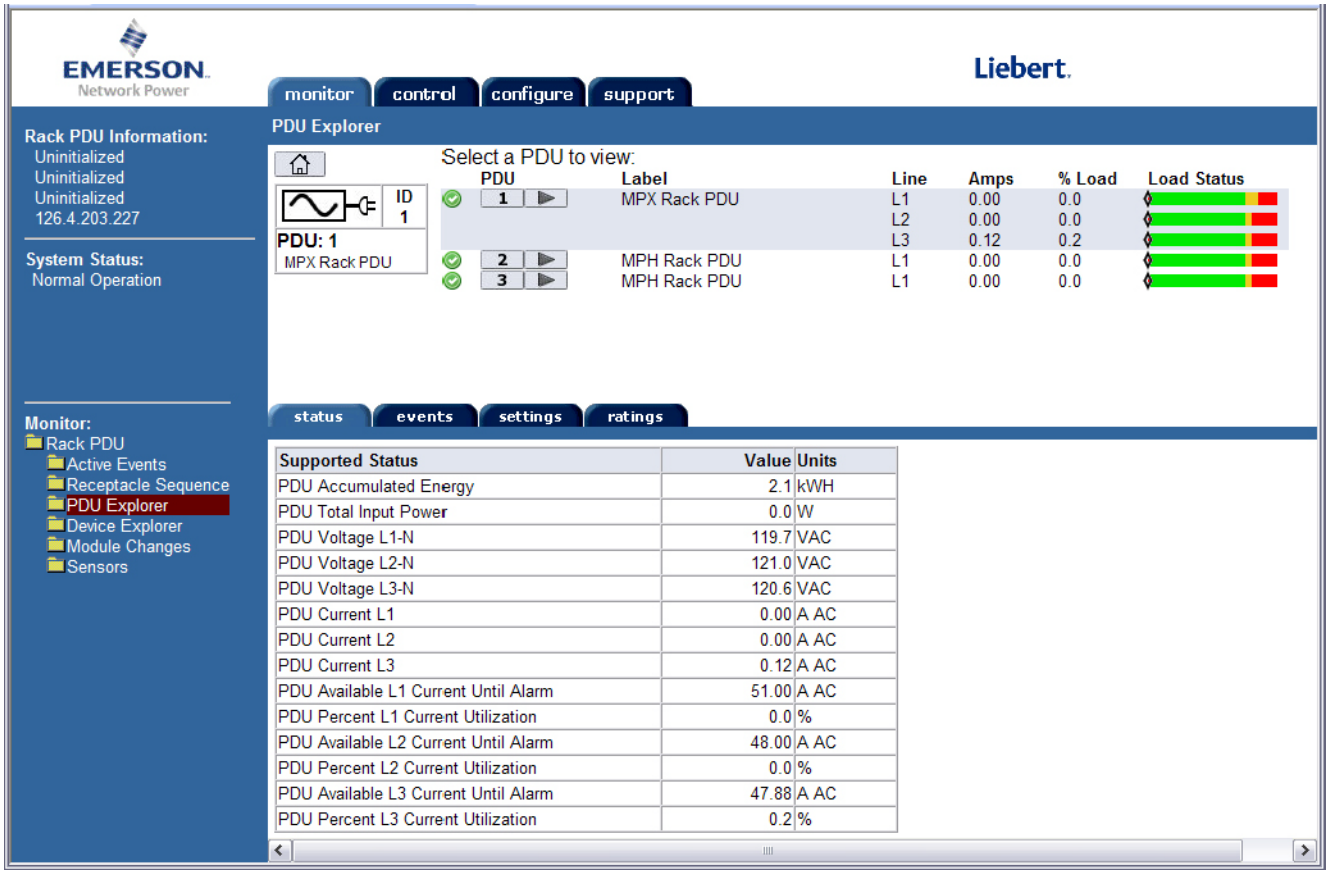


Table 9 PDU Explorer - Status subtab elements

Element	Description
Supported Status	Displays the selected component measurement name
Value	Displays the selected component measurement value. If the Value field is empty, Value data is not configured.
Units	Displays the selected component units—i.e., the established measure used as the standard

7.3.2 Monitor Tab: PDU Explorer - Events Subtab

The **Events** subtab displays the status of events for the selected component.

- Click on the **Monitor** tab at the top of the window.
- Click on **PDU Explorer** in the left pane.
- Select the PDU or other component in the right pane.
- Click on the **Events** subtab. The viewing area in the right pane displays the data shown below and described in **Table 10**.

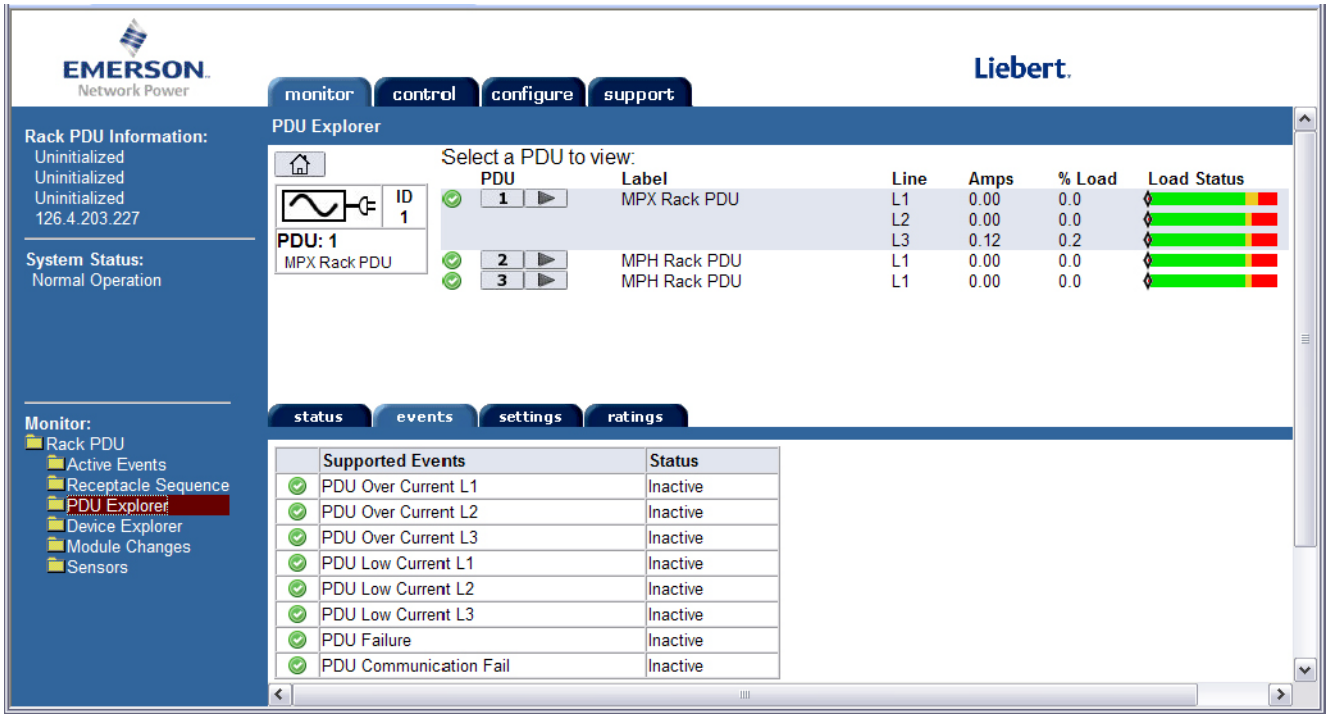


Table 10 PDU Explorer - Events subtab elements

Element	Description
Status Icon	Displays the icon that represents the current status of the event. See **6.1 - Understanding Icons**.
Supported Events	Displays events currently being monitored for selected components.
Status	Displays the current event status: Active or Inactive.

7.3.3 Monitor Tab: PDU Explorer - Settings Subtab

The **Settings** subtab displays the settings that may be configured under the **Control** tab for the selected component. For details on configuring these settings, see:

- **8.2.1 - Controlling a PDU - Settings Tab**
- **8.2.3 - Controlling a Branch - Settings Tab**
- **8.2.5 - Controlling a Receptacle - Settings Tab**

To access the **Settings** subtab:

- Click on the **Monitor** tab at the top of the window.
- Click on **PDU Explorer** in the left pane.
- Select the PDU or other component in the right pane.
- Click on the **Settings** subtab. The viewing area in the right pane displays the data shown below and described in **Table 11**.

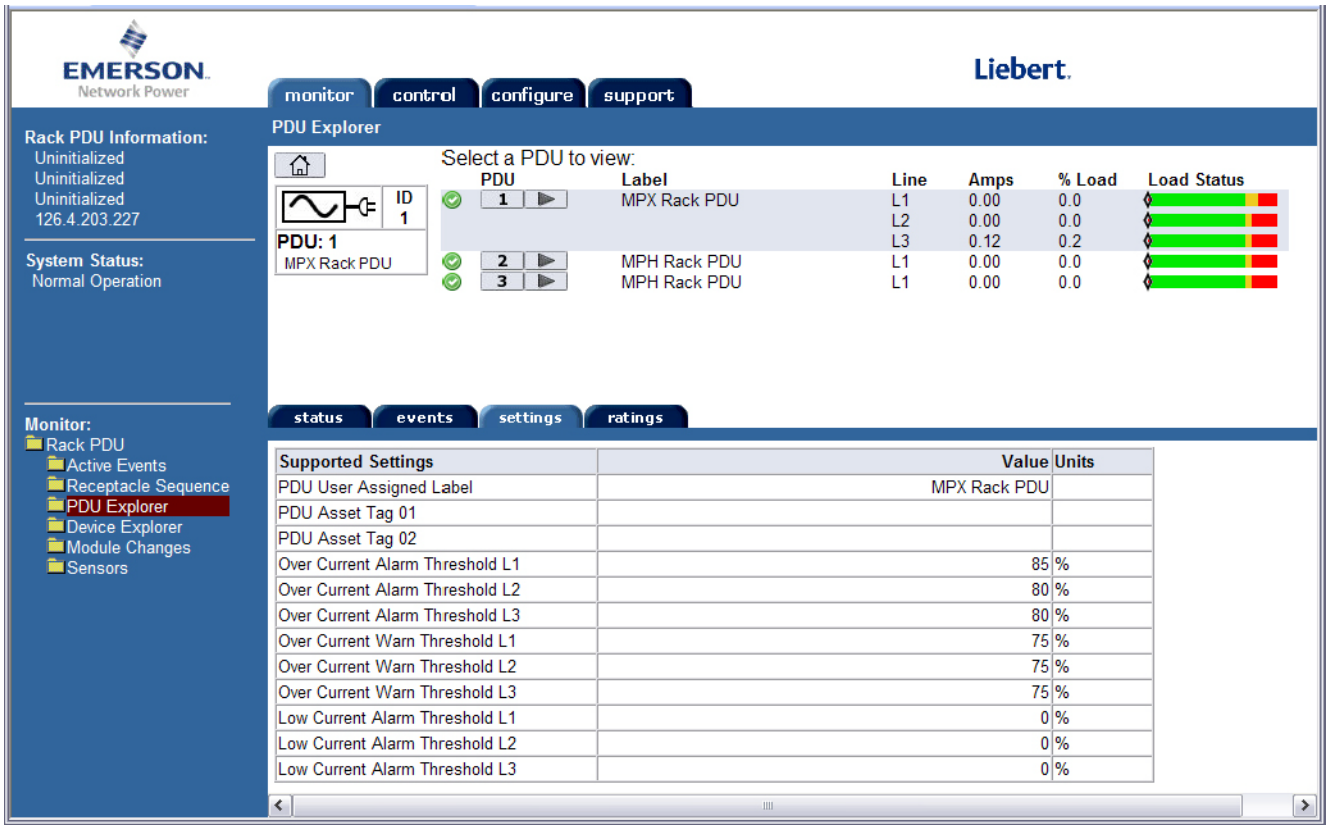


Table 11 PDU Explorer - Settings subtab elements

Element	Description
Supported Settings	Displays settings currently being monitored for selected components.
Value	Displays the selected component measurement value. If the Value field is empty, Value data is not configured.
Units	Displays the selected component units—i.e., the established measure used as the standard. If the Units field is empty, the unit information is not applicable.

7.3.4 Monitor Tab: PDU Explorer - Ratings Subtab

The **Ratings** subtab displays item ratings and related information for the selected component.

- Click on the **Monitor** tab at the top of the window.
- Click on **PDU Explorer** in the left pane.
- Select the PDU or other component in the right pane.
- Click on the **Ratings** subtab. The viewing area in the right pane displays the data shown below and described in **Table 12**.

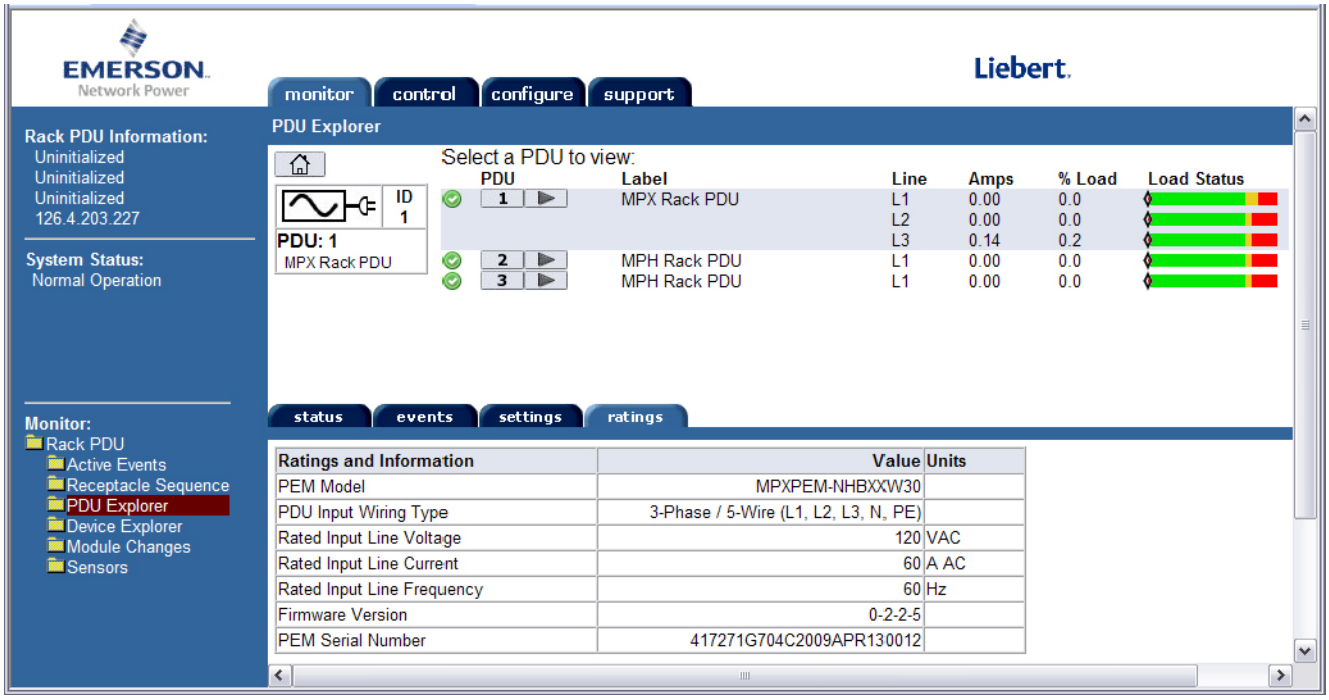


Table 12 PDU Explorer - Ratings subtab elements

Element	Description
Ratings & Information	Displays the name of the parameter, such as PEM Model or Firmware Version.
Value	Displays the selected component measurement value. If the Value field is empty, Value data is not configured.
Units	Displays the selected component units—i.e., the established measure used as the standard. If the Units field is empty, the unit information is not applicable.

7.4 Monitor Tab: Device Explorer - Overview

The Device Explorer displays a list of all receptacles on a single Rack PDU.

To access the Device Explorer:

- Click on the **Monitor** or **Control** tab at the top of the window:
  - The **Monitor** tab permits viewing only.
  - The **Control** tab allows authorized users to perform control functions (see **8.2 - Liebert Rack PDU Control Operations** for additional information).
- Click on **Device Explorer** in the left pane. The viewing area in the right pane displays the data shown below and described in **Table 13**.
- In the Search for Label box, enter text to display only receptacles that meet the search criteria.
- Click on a receptacle name or ID link—for example, *Receptacle 2* or *1-3-2*—to access the PDU Explorer view of receptacle details for viewing or configuration purposes. The columns at right display icons to indicate the state of each receptacle: On/Off, Locked/Unlocked/No Control and Normal/Warning/Alarm (see **Table 13** and **6.1 - Understanding Icons**).

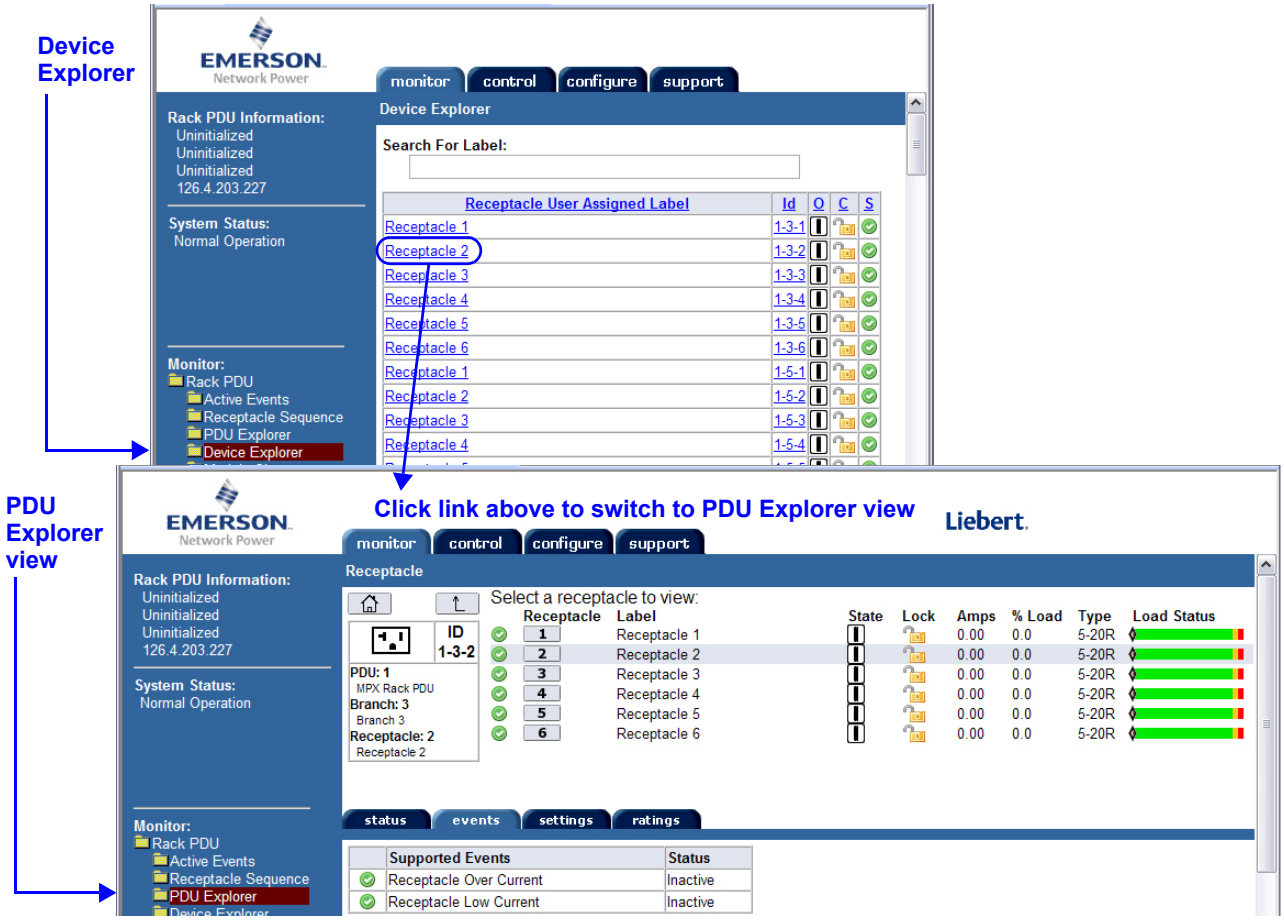


Table 13 Device Explorer components

Element*	Description
Receptacle User-Assigned Label	Displays the name the user selected for each listed receptacle——also links to the PDU Explorer.
ID	Displays the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID** for a given receptacle—also links to the PDU Explorer.
Icons indicate the state of the receptacle (see **6.1 - Understanding Icons**):	
O (On/Off)	Icon indicates the receptacle is turned **On** or **Off**.
C (Control)	Icon indicates whether changes are allowed (**Locked**, **Unlocked** or **No Control**).
S (Status)	Icon indicates the operating condition (**Normal**, **Warning** or **Alarm**).

*** Note:** Click on an underlined heading to sort the list by entries in that column.

7.5 Monitor Tab: Module Changes *(View Only)*

Use this option to view a list of unacknowledged changes to the PDU: components that have been added or removed but not yet acknowledged. (To perform control functions, see **8.4 - Control Tab: Module Changes**.)

- Click on the **Monitor** tab at the top of the window.
- Click on **Module Changes** in the left pane to view a list of PDU components that have been added or removed but not yet acknowledged.
- The viewing area in the right pane displays the data shown below and described in **Table 14**.

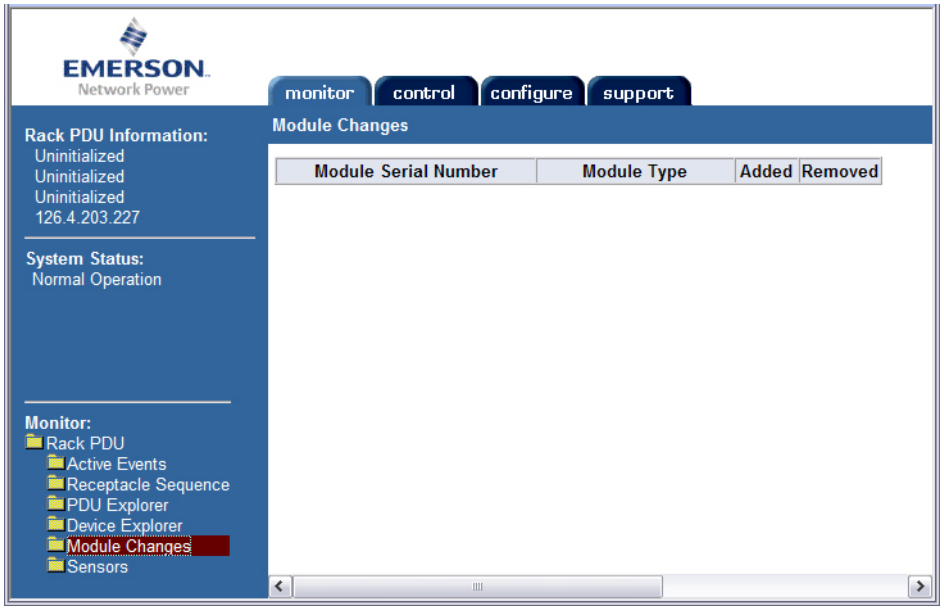


Table 14 Monitor tab: Module Changes elements

Element	Description
Module Serial Number	Displays the serial number of each listed module
Module Type	Indicates the type of component—PDU, branch or receptacle
Added	Indicates whether the module has been added to the PDU
Removed	Indicates whether the module has been removed from the PDU

7.6 Monitor Tab: Sensors - Overview

Use this option to view a list of all connected Liebert SN™ sensors with their status. (To perform control functions, see **8.5 - Controlling a Sensor - Settings Tab**.)

- Click on the **Monitor** tab at the top of the window.
- Click on **Sensors** in the left pane to view information on sensors installed on the PDU.
- The viewing area in the right pane displays the data shown below and described in **Table 15**.

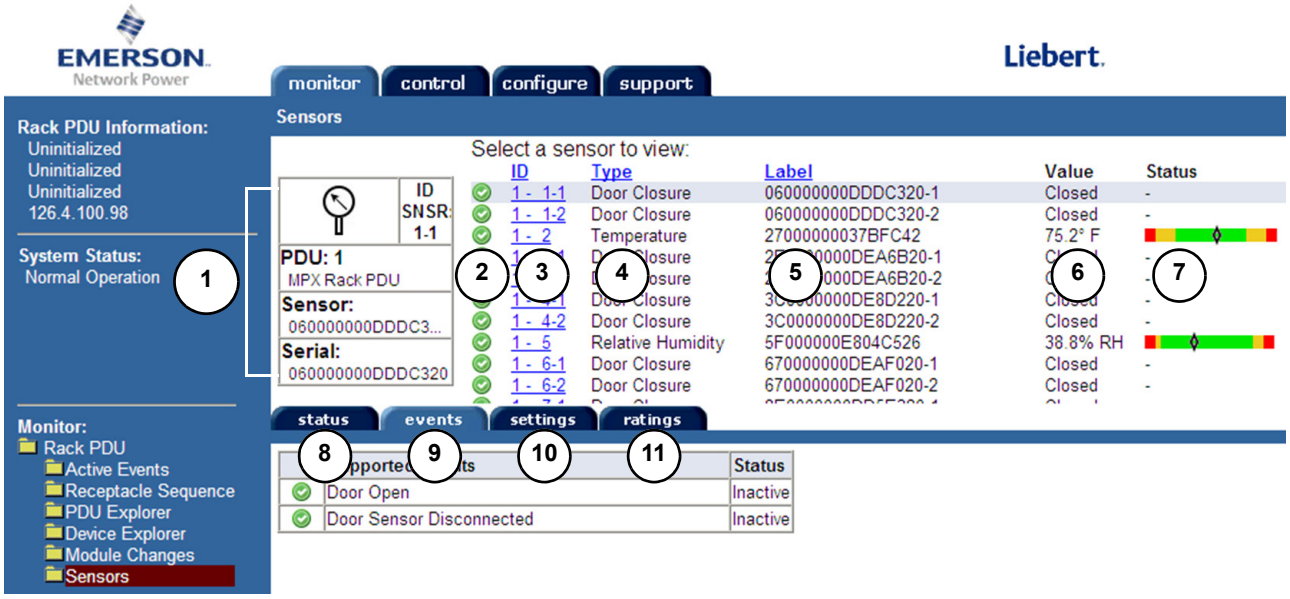
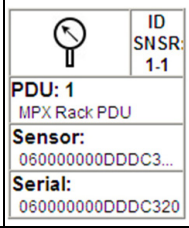


Table 15 Monitor tab: Sensors elements and parameters

#	Item	Item Description	Purpose
1		Component Identification	Displays a sensor icon to indicate the type of component selected, as well as: • Sensor ID number—for example, *1-1* • ID number and user-assigned label of the PDU where the sensor is installed • User-assigned name of the sensor • Serial number of the sensor
2		Status Icon	Displays an icon to represents the current status of the sensor—e.g., *Normal*. See **6.1 - Understanding Icons**.
3		Sensor ID Number	Click to select a given sensor to view its information in the lower portion of the window.
4	Type	Sensor Type	Displays the kind of sensor—e.g., *Door Closure, Temperature*, *Relative Humidity*.
5	Label	User-Assigned Name	Displays the configured name of the sensor.
6	Value	State of Monitored Area	Displays the state or measurement value of the selected component—for example, *Closed*, *75.2°F* or *38.8% RH*.
7		Status Graph	*(For temperature/humidity sensors only)* Graphically displays the temperature or humidity value relative to configured thresholds for low and high setpoints.
8	Status	Sensors Subtab	View information on the status of the sensor.
9	Events	Sensors Subtab	View information on the status of supported events.
10	Settings	Sensors Subtab	View selected component's thresholds and identifiers that can be configured.
11	Ratings	Sensors Subtab	View the selected component's rating.

7.6.1 Monitor Tab: Sensors - Status Subtab

The **Status** subtab displays the current measurement data of the selected sensor.

- Click on the **Monitor** tab at the top of the window.
- Click on **Sensors** in the left pane.
- Select the sensor in the right pane.
- Click on the **Status** subtab. The viewing area in the right pane displays the data shown below and described in **Table 16**.

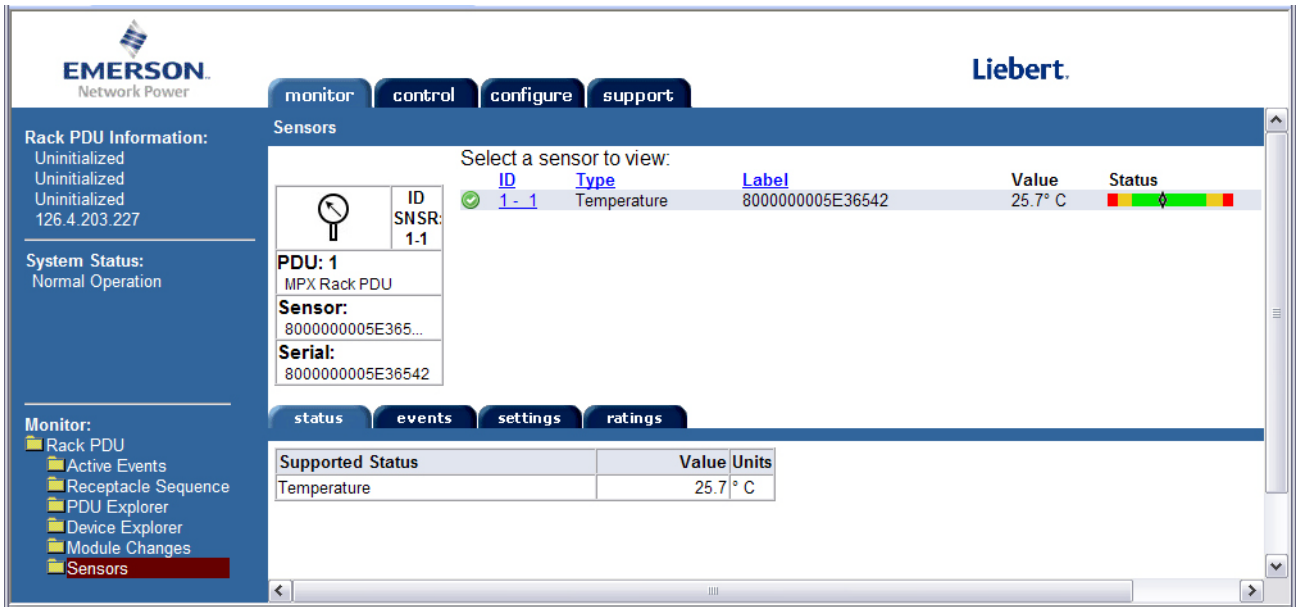


Table 16 Sensors - Status subtab elements and parameters

Element	Description
Supported Status	Displays the selected sensor parameter name—for example, *Temperature*.
Value	Displays the selected sensor measurement value. If empty, Value data is not configured.
Units	Displays the units for the selected sensor—e.g., *°C*. See **9.9.2 - Specify Web Display Options** to specify which temperature units to display, Celsius or Fahrenheit.

7.6.2 Monitor Tab: Sensors - Events Subtab

The **Events** subtab displays the status of events for the selected sensor.

- Click on the **Monitor** tab at the top of the window.
- Click on **Sensors** in the left pane.
- Select the sensor in the right pane.
- Click on the **Events** subtab. The viewing area in the right pane displays the data shown below and described in **Table 17**.

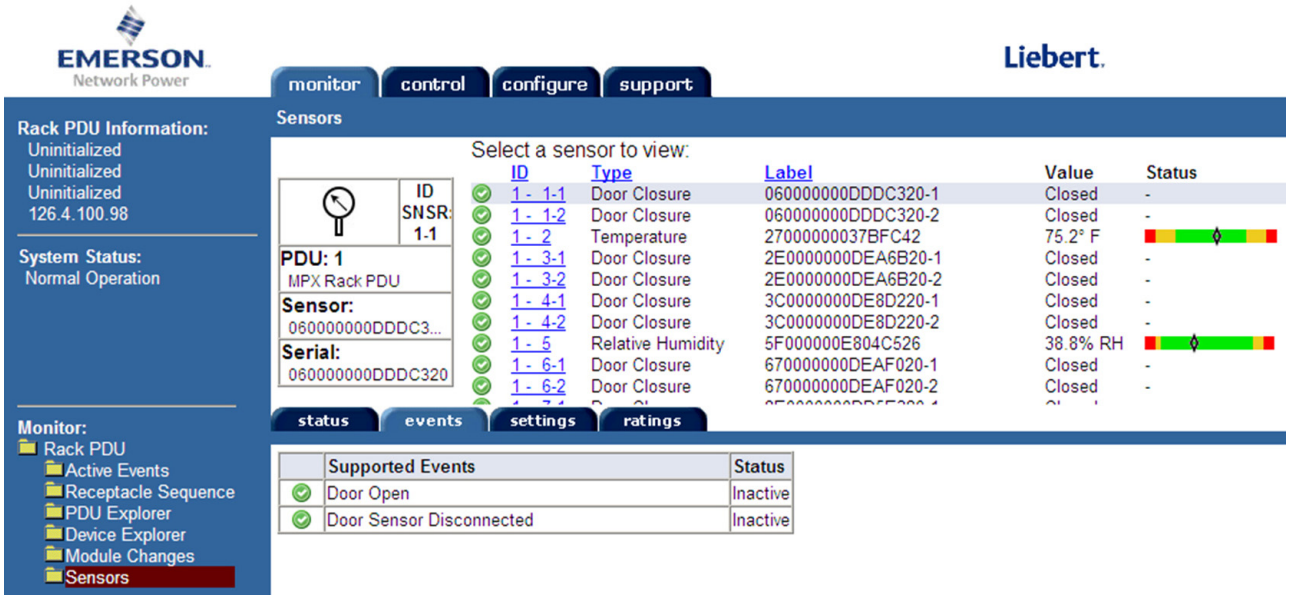


Table 17 Sensors - Events subtab elements

Element	Description
Status Icon	Displays an icon to represent the current status of the event. See **6.1 - Understanding Icons**.
Supported Events	Displays events currently being monitored for the selected sensor—for example, *Door Open*.
Status	Displays the current event status: Active or Inactive.

7.6.3 Monitor Tab: Sensors - Settings Subtab

The **Settings** subtab displays the settings that may be configured under the **Control** tab for the selected sensor. For details on configuring these settings, see:

- **8.5 - Controlling a Sensor - Settings Tab**

To access the **Settings** subtab:

- Click on the **Monitor** tab at the top of the window.
- Click on **Sensors** in the left pane.
- Select the sensor in the right pane.
- Click on the **Settings** subtab. The viewing area in the right pane displays the data shown below and described in **Table 18**.

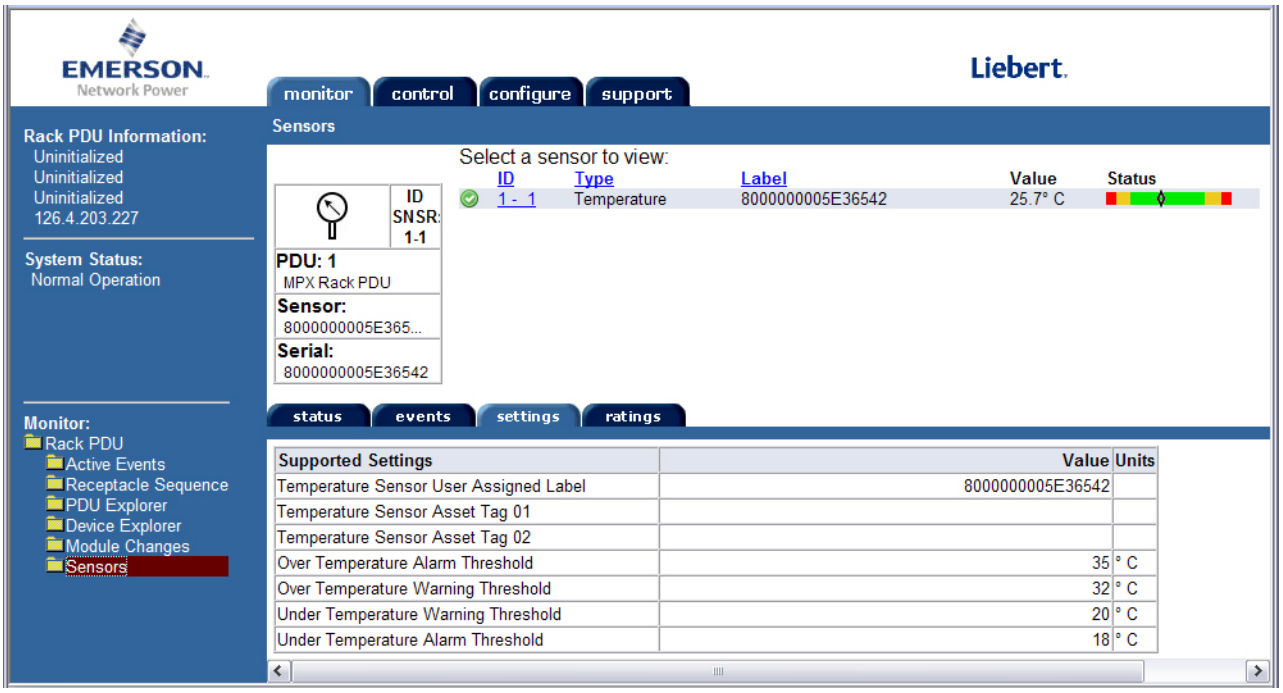


Table 18 Sensors - Settings subtab elements

Element	Description
Supported Settings	Displays settings currently being monitored for the selected sensor.
Value	Displays the selected sensor measurement value. If empty, Value data is not configured.
Units	Displays the selected component units—i.e., the established measure used as the standard. If the Units field is empty, the unit information is not applicable.

7.6.4 Monitor Tab: Sensors - Ratings Subtab

The **Ratings** subtab displays item ratings and related information for the selected sensor.

- Click on the **Monitor** tab at the top of the window.
- Click on **Sensors** in the left pane.
- Select the sensor in the right pane.
- Click on the **Ratings** subtab. The viewing area in the right pane displays the data shown below and described in **Table 19**.

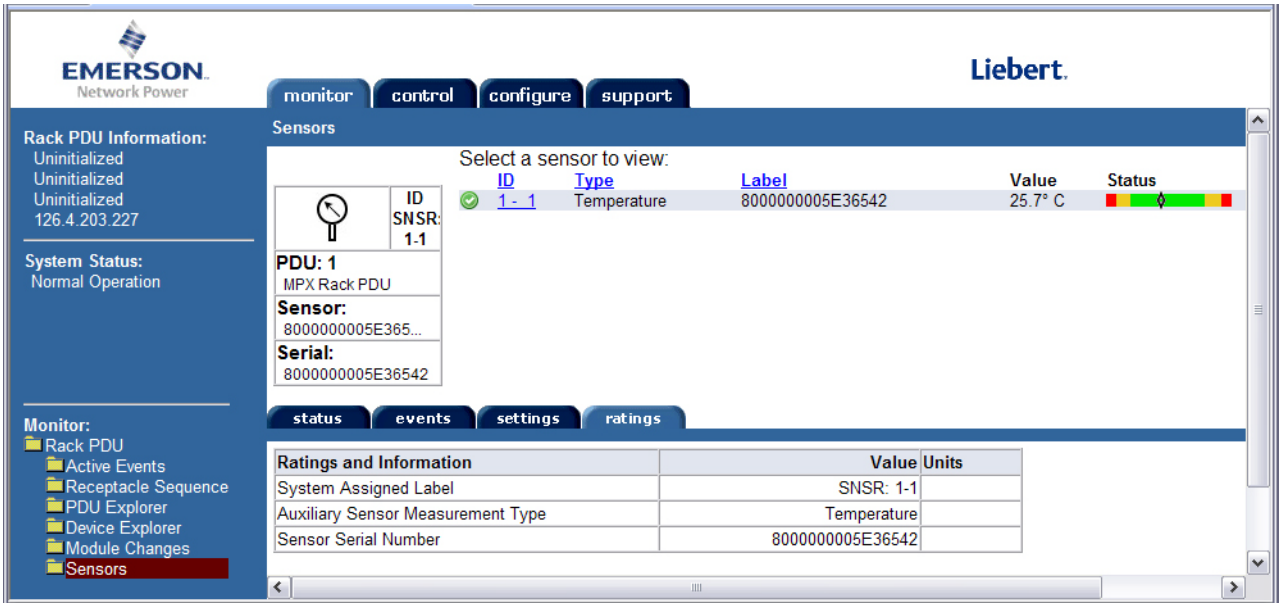


Table 19 Sensors - Ratings subtab elements

Element	Description
Ratings & Information	Displays the name of the parameter, such as *System Assigned Label*.
Value	Displays the selected sensor measurement value. If empty, Value data is not configured.
Units	Displays the selected component units—i.e., the established measure used as the standard. If the Units field is empty, the unit information is not applicable.

8.0 Control Tab Options and Operations

The Control tab provides password-protected access to control functions available for the PDU, such as naming components and turning receptacles On or Off. This tab enables authorized users to edit data.

Table 20 shows the operations available through the Control tab and a guide to detailed information on each operation.

Table 20 Control tab operations

Control operation	Refer to:
Receptacle Sequence	**8.1 - Control Tab: Receptacle Sequence**
PDU Explorer	**8.2 - Liebert Rack PDU Control Operations**
Device Explorer	**8.3 - Control Tab: Device Explorer - Control Tab**
Module Changes	**8.4 - Control Tab: Module Changes**
Sensors	**8.5 - Controlling a Sensor - Settings Tab**

8.1 Control Tab: Receptacle Sequence

Use this option to perform control functions on receptacles, such as turning receptacles On or Off or changing their status to Locked (no changes permitted) or Unlocked.

- Click on the **Control** tab at the top of the window.
- Click on **Receptacle Sequence** in the left pane to display a list of all receptacles on a PDU.
- The viewing area in the right pane displays the data shown below and described in **Table 21**.

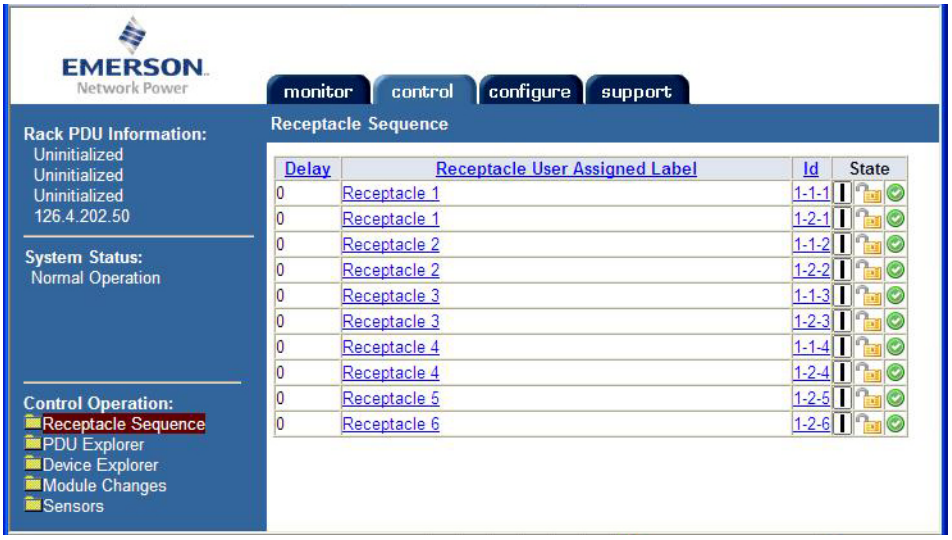


Table 21 Control tab: Receptacle Sequence elements

Element	Description
Delay*	Displays the number of seconds that will elapse before power is applied to the receptacle (Power On Delay) upon startup of the Rack PDU. Add a 30-second communication delay to the Power On Delay to account for latency in communication from the first PDU in a Rack PDU Array to the last PDU in the array. The Power On Delay countdown timer begins when: • Power to the MPX PEM or the Liebert MPH™ is interrupted or • Multiple receptacles are rebooted.
Receptacle User-Assigned Label*	Displays the user-assigned name of each receptacle on the PDU
ID*	Displays the component ID in the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID** for each listed receptacle.
State	Icons indicate the general state of the receptacle: On/Off, Locked/Unlocked/No Control and Normal/Warning/Alarm operation condition. See **6.1 - Understanding Icons**.

*** Note:** Click on an underlined heading to sort the list by that column.

- To make changes, click on a receptacle label (e.g., *Receptacle 1*) or an ID (e.g., *1-1-1*) to open the PDU Explorer.
- Proceed to **8.2.6 - Controlling a Receptacle - Commands Tab** for details to make the changes.

8.2 Liebert Rack PDU Control Operations

The Liebert RPC features tools for controlling components in the system via the **Control** tab using PDU Explorer and Device Explorer.

- The **Settings** tab allows you to configure these settings for individual components (refer to the following sections for details):

Component (accessible via PDU Explorer*)	Configurable Settings				For details, see:
	Name	Tag	Thresholds	Other	
PDU	✔	✔	✔	—	**8.2.1 - Controlling a PDU - Settings Tab**
Branch	✔	✔	✔	—	**8.2.3 - Controlling a Branch - Settings Tab**
Receptacle*	✔	✔	✔	✔ Power-on delay ✔ Lock / unlock settings	**8.2.5 - Controlling a Receptacle - Settings Tab**
Sensor	✔	✔	✔	—	**8.5 - Controlling a Sensor - Settings Tab**

* Receptacles are also accessible via Device Explorer.

- The **Commands** tab allows you to control selected functions for individual components (refer to the following sections for details):

Component (accessible via PDU Explorer*)	Available Commands			For details, see:
	Accumulated Energy	Generic Test Event	Receptacle Power State	
PDU	✔	✔	—	**8.2.2 - Controlling a PDU - Commands Tab**
Branch	✔	—	—	**8.2.4 - Controlling a Branch - Commands Tab**
Receptacle*	✔	—	✔	**8.2.6 - Controlling a Receptacle - Commands Tab**

* Receptacles are also accessible via Device Explorer.

NOTE

*Refer to **7.3 - Monitor Tab: PDU Explorer - Overview** for detailed information on using PDU Explorer.*

8.2.1 Controlling a PDU - Settings Tab

1. Click the **Control** tab at the top, then select **PDU Explorer** in the left pane.
2. Select the desired PDU, then click the **Settings** subtab, shown below.
3. Click the **Edit** button, then make changes as needed (see **Table 22**).
4. When finished editing, click **Save** to save changes (or **Reset** to clear changes).

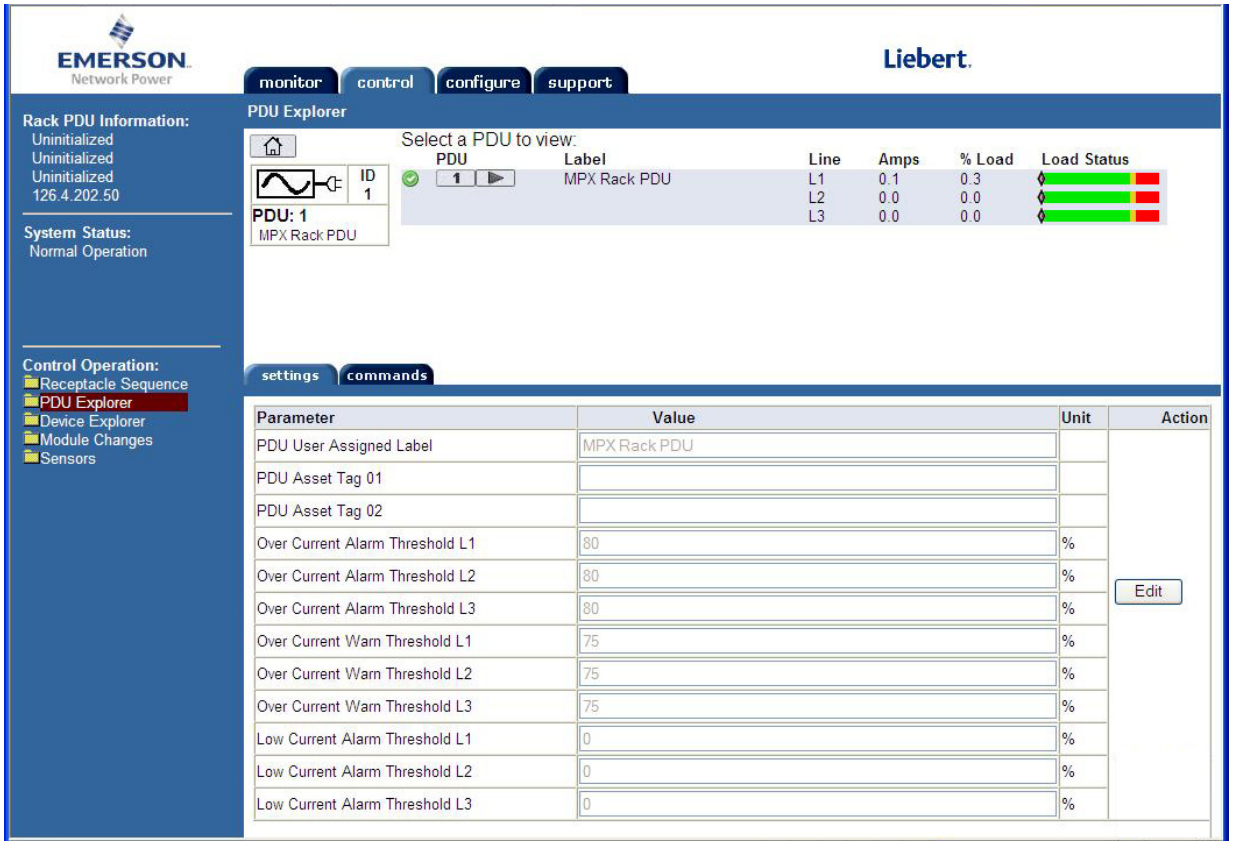


Table 22 PDU Settings tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	Click **Edit** to change values, then click **Save** to save any changes (or **Reset** to clear changes).
Parameter	**Description**
User-Assigned Label	This label is a name for the selected component that appears in the Web interface. The Search tool uses this field to locate components.
Asset Tag 1-2	This tag is a user-provided value to identify the PDU or connected components.
Over Current Alarm L1-3	Set this value to the maximum acceptable percentage of input current capacity for proper operation. This setting will trigger an alarm when the PDU current exceeds this level. This setting may be configured separately for each input phase.
Over Current Warning L1-3	Set this value to a percentage lower than the Over Current Alarm threshold to trigger a warning when the PDU input current exceeds this level. This setting may be configured separately for each input phase.
Low Current Alarm L1-3	Set this value to the minimum acceptable percentage of input current capacity for proper operation. This setting will trigger an alarm when the PDU current falls below this level. Set the value to 0 to disable the alarm. This setting may be configured separately for each input phase.

8.2.2 Controlling a PDU - Commands Tab

1. Click the **Control** tab at the top, then select **PDU Explorer** in the left pane.
2. Select the desired PDU, then click the **Commands** subtab, shown below.
3. To clear the PDU Accumulated Energy counter, click **Reset** (see **Table 23**).
4. In the confirmation dialog box, click **OK** to proceed (or **Cancel** to make no changes).
5. Click the **Send** button to run a Generic Test Event (see **Table 23**).

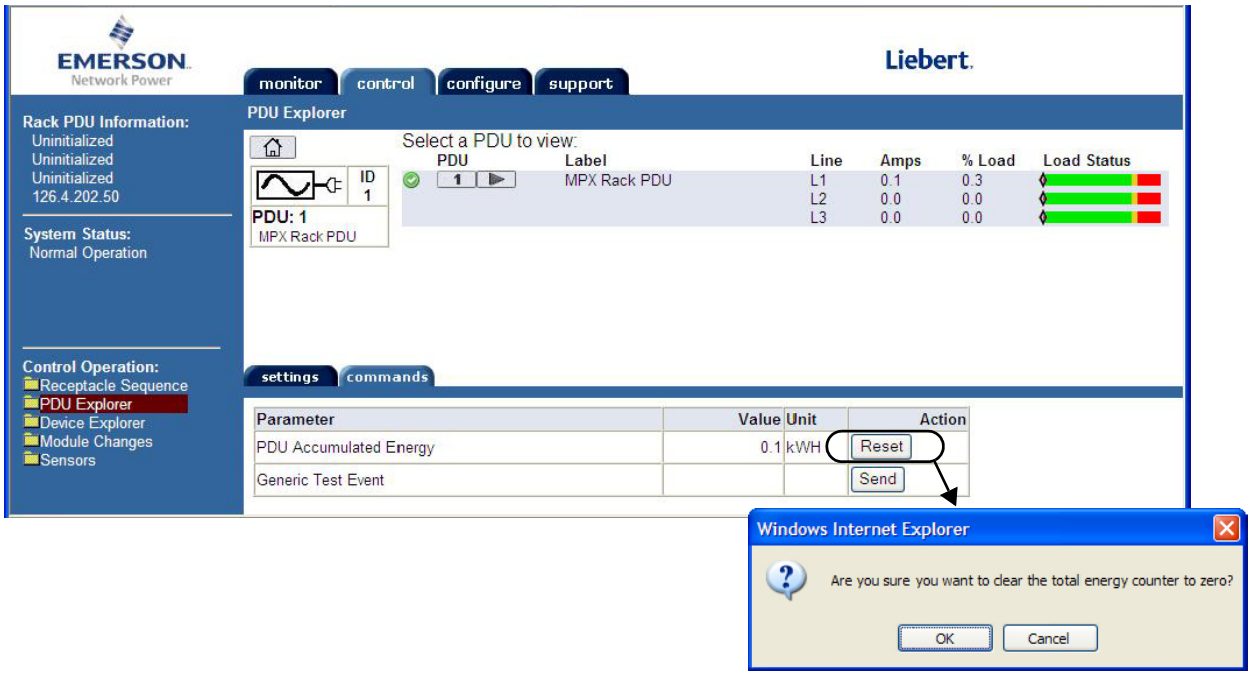


Table 23 PDU Commands tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	• To clear the PDU Accumulated Energy counter, click **Reset** to the right of that parameter. • To run a Generic Test Event, click **Send** to the right of that parameter.
Parameter	**Description**
PDU Accumulated Energy	The total accumulated energy consumption (kWh) for the Rack PDU.
Generic Test Event	A generic SNMP event that can be used to verify that a Network Management System is properly configured to receive SNMP traps from the Rack PDU.

8.2.3 Controlling a Branch - Settings Tab

1. Click the **Control** tab at the top, then select **PDU Explorer** in the left pane.
2. Select the PDU that has the branch you wish to view and click on the ▶ button.
3. Select the desired branch, then click on the **Settings** subtab, shown below.
4. Click the **Edit** button, then make changes as needed (see **Table 24**).
5. When finished editing, click **Save** to save changes (or **Reset** to clear changes).

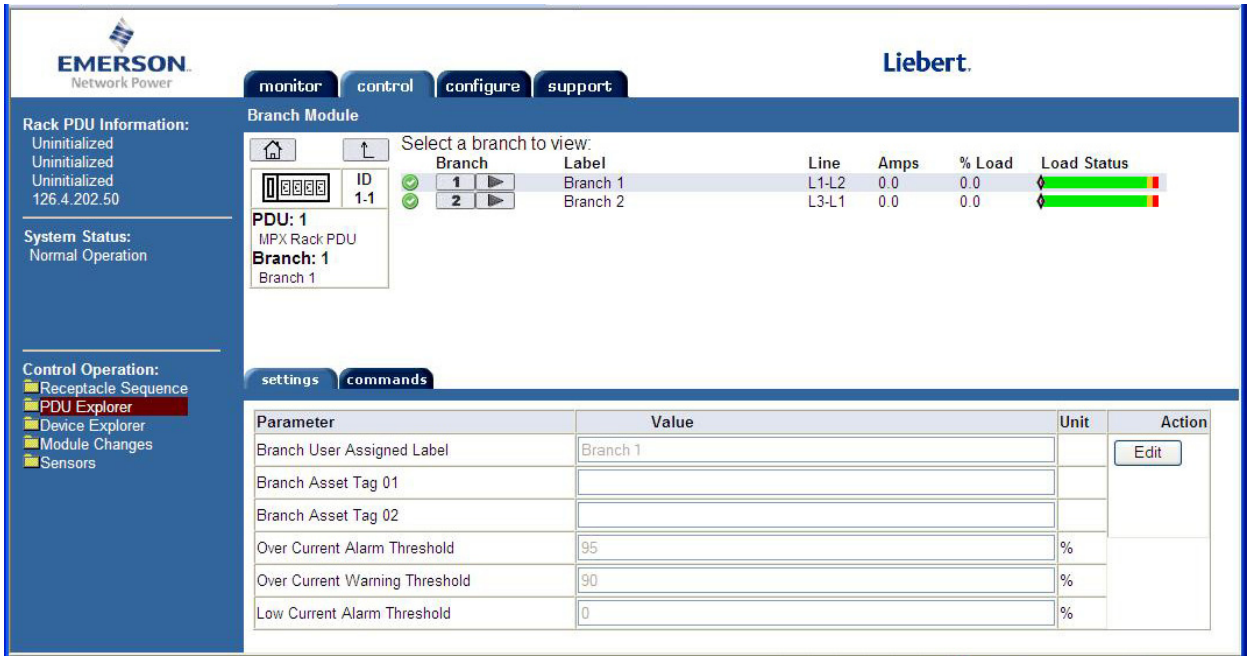


Table 24 Branch Settings tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	Click **Edit** to change values, then click **Save** to save any changes (or **Reset** to clear changes).
Parameter	**Description**
User-Assigned Label	This label is a name for the selected component that appears in the Web interface. The Search tool uses this field to locate components.
Asset Tag 1-2	This tag is a user-provided value to identify the branch or connected components.
Over Current Alarm	Set this value to the maximum acceptable percentage of input current capacity for proper operation. This setting will trigger an alarm when the branch current exceeds this level.
Over Current Warning	Set this value to a percentage lower than the Over Current Alarm threshold to trigger a warning when the branch input current exceeds this level.
Low Current Alarm	Set this value to the minimum acceptable percentage of input current capacity for proper operation. This setting will trigger an alarm when the branch current falls below this level. Set the value to 0 to disable the alarm.

8.2.4 Controlling a Branch - Commands Tab

1. Click the **Control** tab at the top, then select **PDU Explorer** in the left pane.
2. Select the PDU that has the branch you wish to view and click on the ▶ button.
3. Select the desired branch, then click on the **Commands** subtab, shown below.
4. To clear the Branch Accumulated Energy counter, click **Reset** (see **Table 25**).
5. In the confirmation dialog box, click **OK** to proceed (or **Cancel** to make no changes).

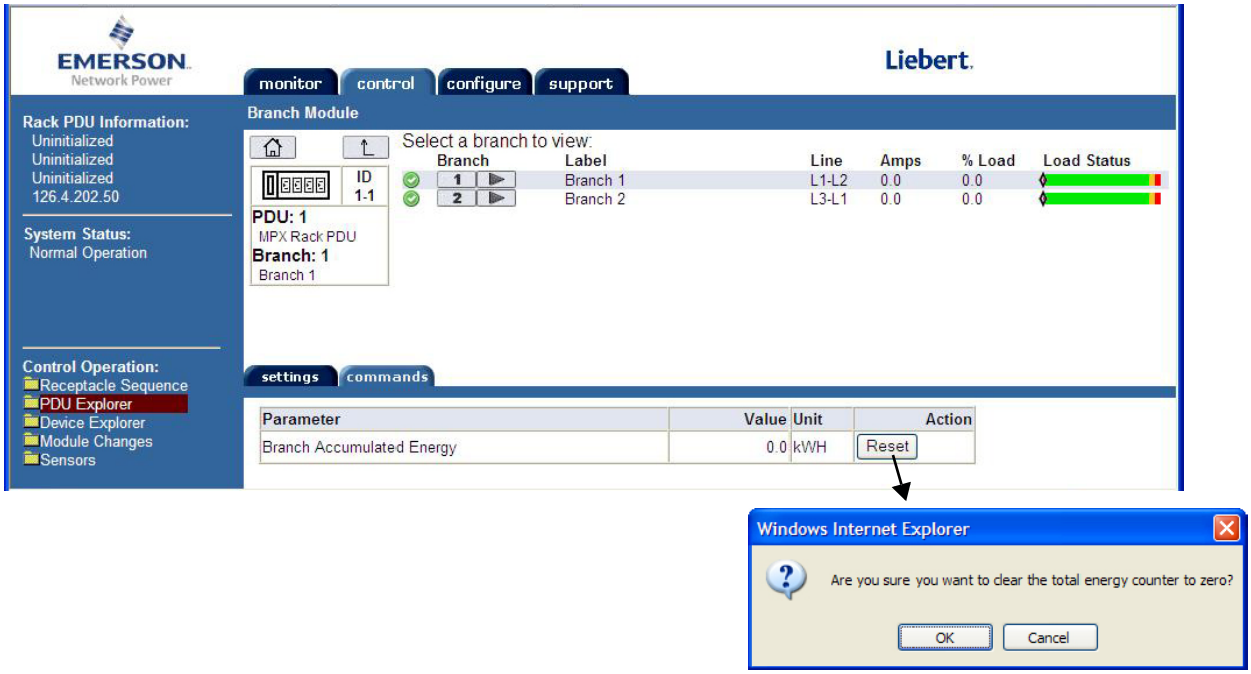


Table 25 Branch Commands tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	To clear the Branch Accumulated Energy counter, click **Reset** to the right of that parameter.
Parameter	**Description**
Branch Accumulated Energy	The total accumulated energy consumption (kWh) for the Branch.

8.2.5 Controlling a Receptacle - Settings Tab

1. Click the **Control** tab at the top, then select either **PDU Explorer** or **Device Explorer** in the left pane.
2. Navigate to the desired receptacle, then click on the **Settings** subtab, shown below. (If needed, click on the ▶ icon to move down to the Receptacle level.)
3. Click the **Edit** button, then make changes as needed (see **Table 26**).
4. When finished editing, click **Save** to save changes (or **Reset** to clear changes).

Table 26 Receptacle Settings tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	Click **Edit** to change values, then click **Save** to save any changes (or **Reset** to clear changes).
Parameter	**Description**
User-Assigned Label	This label is a name for the selected component that appears in the Web interface. The Search tool uses this field to locate components.
Asset Tag 1-2	This tag is a user-provided value to identify the receptacle or connected components.
Power On Delay	This setting specifies the time delay in seconds prior to a receptacle being turned on during power-up.
Over Current Alarm	Set this value to the maximum acceptable percentage of output current capacity for proper operation. This setting will trigger an alarm when the receptacle current exceeds this level.
Over Current Warning	Set this value to a percentage lower than the Over Current Alarm threshold to trigger a warning when the receptacle output current exceeds this level.
Low Current Alarm	Set this value to the minimum acceptable percentage of output current capacity for proper operation. This setting will trigger an alarm when the receptacle current falls below this level. Set the value to 0 to disable the alarm.
Receptacle Control Lock State	This allows the receptacle to be locked to a specific state, which will be maintained in the event of a group action that would normally change the Receptacle state. When locked, the receptacle information cannot be changed.

8.2.6 Controlling a Receptacle - Commands Tab

1. Click the **Control** tab at the top, then select either **PDU Explorer** or **Device Explorer** in the left pane.
2. Navigate to the desired receptacle, then click on the **Commands** subtab, shown below. (If needed, click on the ▶ icon to move down to the Receptacle level.)
3. To change the Receptacle Power State (see **Table 27**):
   - Click **Edit**, then change the value by clicking **Off**, **On** or **Reboot**.
   - Click **Save** to save any changes (or **Reset** to clear changes).
4. To clear the Receptacle Accumulated Energy counter, click **Reset** (see **Table 27**).
5. In the confirmation dialog box, click **OK** to proceed (or **Cancel** to make no changes).

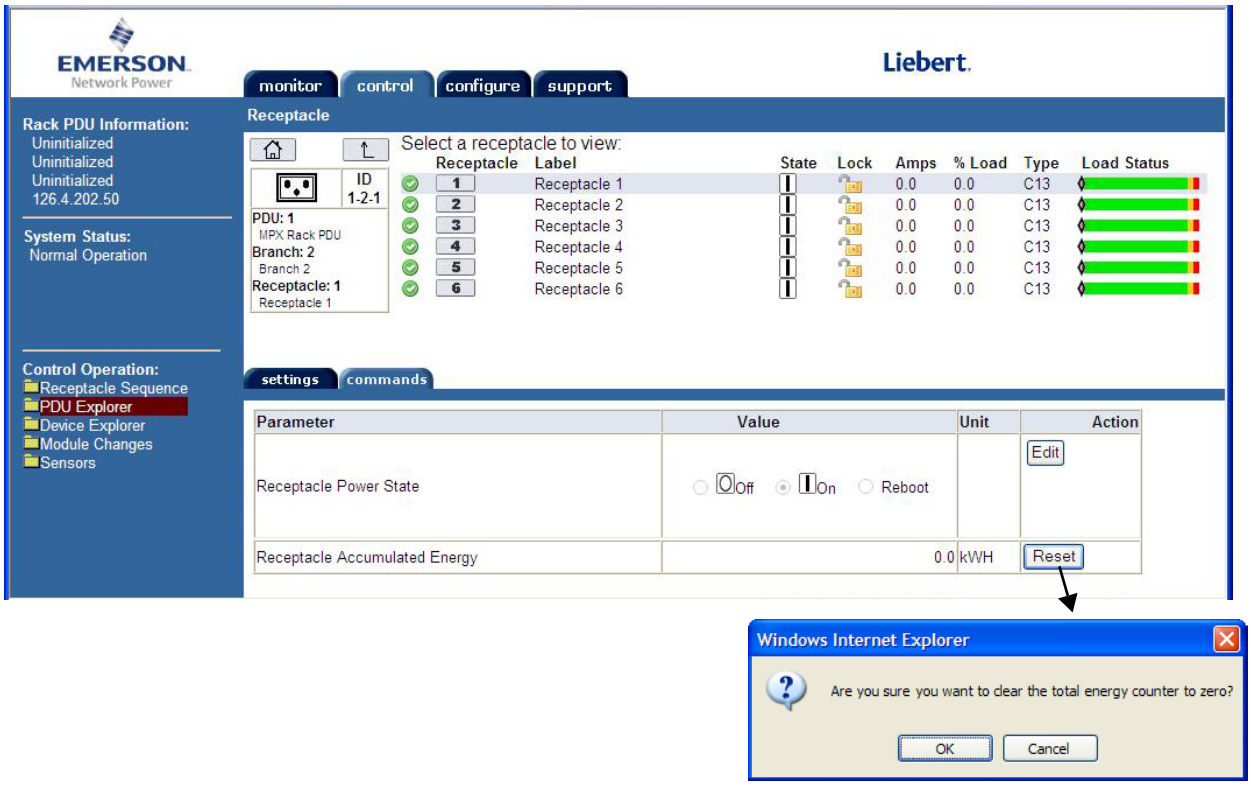


Table 27 Receptacle Commands tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action - Receptacle Power State	• To change the Receptacle Power State, click **Edit**, change the value by clicking **Off**, **On** or **Reboot**, then click **Save** to save any changes (or **Reset** to clear changes).
Action - Receptacle Accumulated Energy	• To clear the Receptacle Accumulated Energy counter, click **Reset** to the right of that parameter.
Parameter	**Description**
Receptacle Power State	The desired state of receptacle (On/Off). When changed, as described above (see **Action - Receptacle Power State**): • The receptacle state will change immediately. • If changed to Off or On, the receptacle will assume this state upon power-up. • If changed to Reboot, the receptacle will be On upon power-up.
Receptacle Accumulated Energy	The total accumulated energy consumption (kWh) for the receptacle.

8.3 Control Tab: Device Explorer - Control Tab

To perform control operations on receptacles:

- Click on the **Control** tab at the top of the window.
- Click on **Device Explorer** in the left pane.
- Check (✔) the box to the left of each receptacle label to select individual receptacles.
  Note: To select all receptacles, check the box in the top left corner of the table, shown below.
- Click on the appropriate Control Action drop-down menu, then make changes as needed. Refer to **Table 28** for details on the menu options.
- Click the **Execute** button to make the changes.

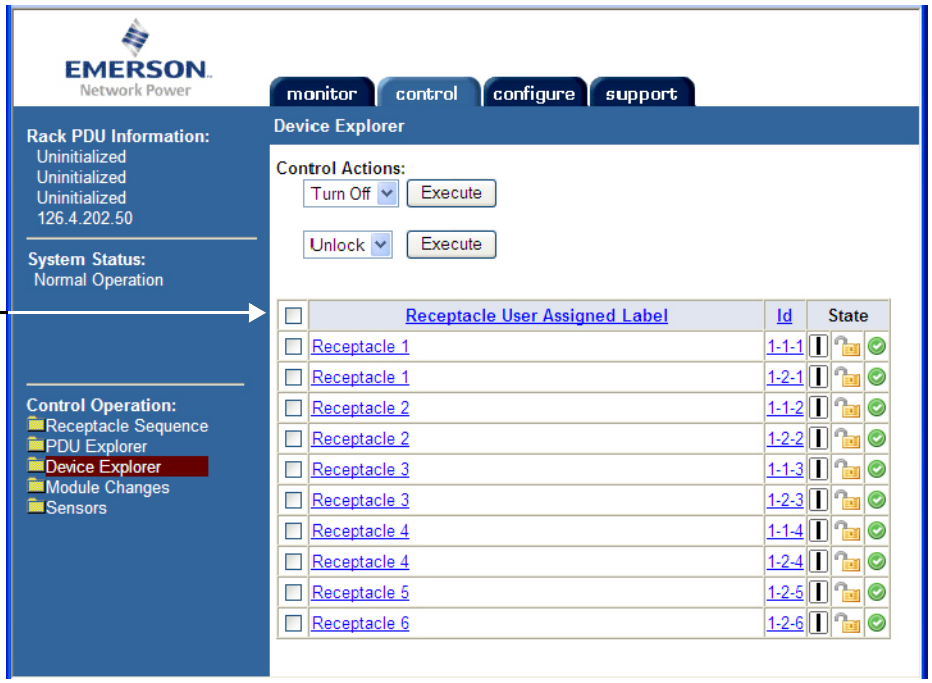


Table 28 Device Explorer Control tab elements

Element	Description
Control Actions: On/Off/Reboot	Select from the drop-down list, then click **Execute**: • **Turn On**: Send a command to turn On the selected receptacles. • **Turn Off**: Send a command to turn Off the selected receptacles. • **Reboot**: Send a command to reboot the selected receptacles.
Control Actions: Lock/Unlock	Select from the drop-down list, then click **Execute**: • **Lock**: Lock the current settings for the selected receptacles to prevent any changes. • **Unlock**: Unlock to allow changes to the current settings for the selected receptacles.
Check box	Enter a check mark to select a receptacle to make changes. Check the box in the heading row to select all receptacles. Control actions will be applied to all checked receptacles.
Receptacle User-Assigned Label	Displays the name assigned to a receptacle.
ID	Displays the component ID shown in the format *PDU# - Branch# - Receptacle#* described in **5.2 - Rack PDU Component ID**.
State	Icons indicate the general state of the receptacle: Off/On, Locked/Unlocked/No Control and Normal/Warning/Alarm operating condition. See **6.1 - Understanding Icons**.

NOTE
To view receptacle details, click a receptacle label or ID to open the PDU Explorer.

8.4 Control Tab: Module Changes

Use this option to confirm the installation or removal of components. For example, after installing or removing these components, follow the instructions in this section to confirm the action:

- MPX BRM Module added/removed
- Sensor added/removed
- Rack PDU added/removed (applies to Rack PDU Array configuration; see **1.3 - Interconnecting Rack PDUs to Create a Rack PDU Array™**)

To view or acknowledge changes to the module:

- Click on the **Control** tab at the top of the window.
- Click on **Module Changes** in the left pane to display a list of PDU components that have been added or removed but not yet acknowledged.
- The viewing area in the right pane displays the data shown below and described in **Table 29**.

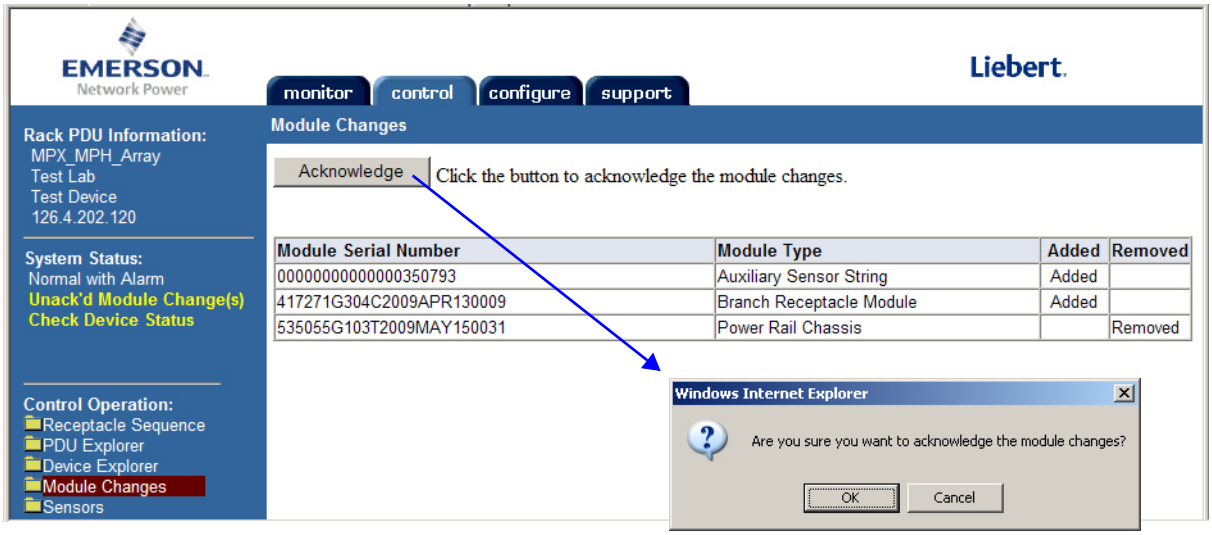


Table 29 Control tab: Module Changes elements

Element	Description
Module Serial Number	Displays the serial number for each listed module.
Module Type	Indicates the kind of component—e.g., auxiliary sensor string or branch receptacle module.
Added	**Added** indicates a module has been connected to the PDU.
Removed	**Removed** indicates a module has been disconnected from the PDU.

- Module changes must be acknowledged before remote management is enabled or disabled. Click the **Acknowledge** button for the changes to take effect.

CAUTION

After a module is disconnected from the PDU and the change is acknowledged in the Module Changes option of the Control tab, **the module's information is removed from the system**.

If that same module is later reinstalled, it must be reconfigured as a new module. First, acknowledge the addition of the reconnected module in the Module Changes option of the Control tab, then make other configuration changes as needed.

- A confirmation window asks whether to proceed. Click **OK** to acknowledge the changes (or **Cancel** to close without confirming).

8.5 Controlling a Sensor - Settings Tab

1. Click the **Control** tab at the top, then click **Sensors** in the left pane.
2. Select the desired sensor to display its data in the **Settings** subtab, shown below. Click the **Edit** button, then make changes as needed (see **Table 30**).
3. When finished editing, click **Save** to save changes (or **Reset** to clear changes).

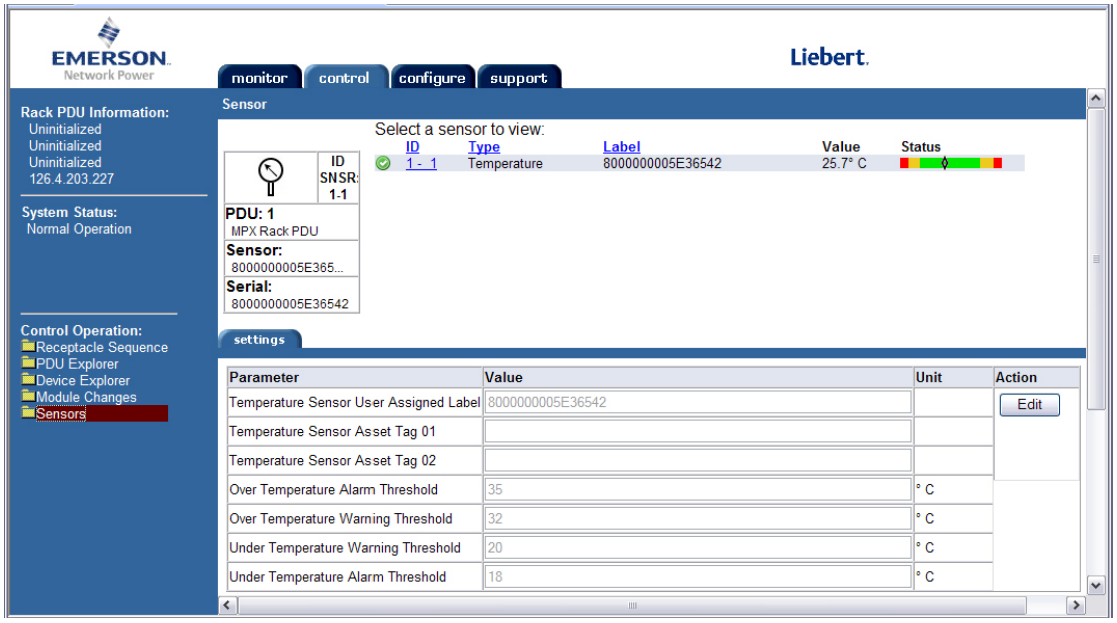


Table 30 Sensor Settings tab - elements and parameters

Element	Description
Parameter	Displays the name of the associated setting.
Value	Displays the configured setting for this parameter.
Unit	Displays the units—the established measure used as the standard—if applicable.
Action	Click **Edit** to change values, then click **Save** to save any changes (or **Reset** to clear changes).
PARAMETERS FOR ALL SENSORS	
User-Assigned Label	This label is a name for the selected component that appears in the Web interface. The Search tool uses this field to locate components.
Asset Tag 1-2	This tag is a user-provided value to identify the sensor or connected components.

9.0 CONFIGURE TAB OPTIONS AND OPERATIONS

The Configure tab provides password-protected access to configuration options including system and network settings, messaging and firmware updates.

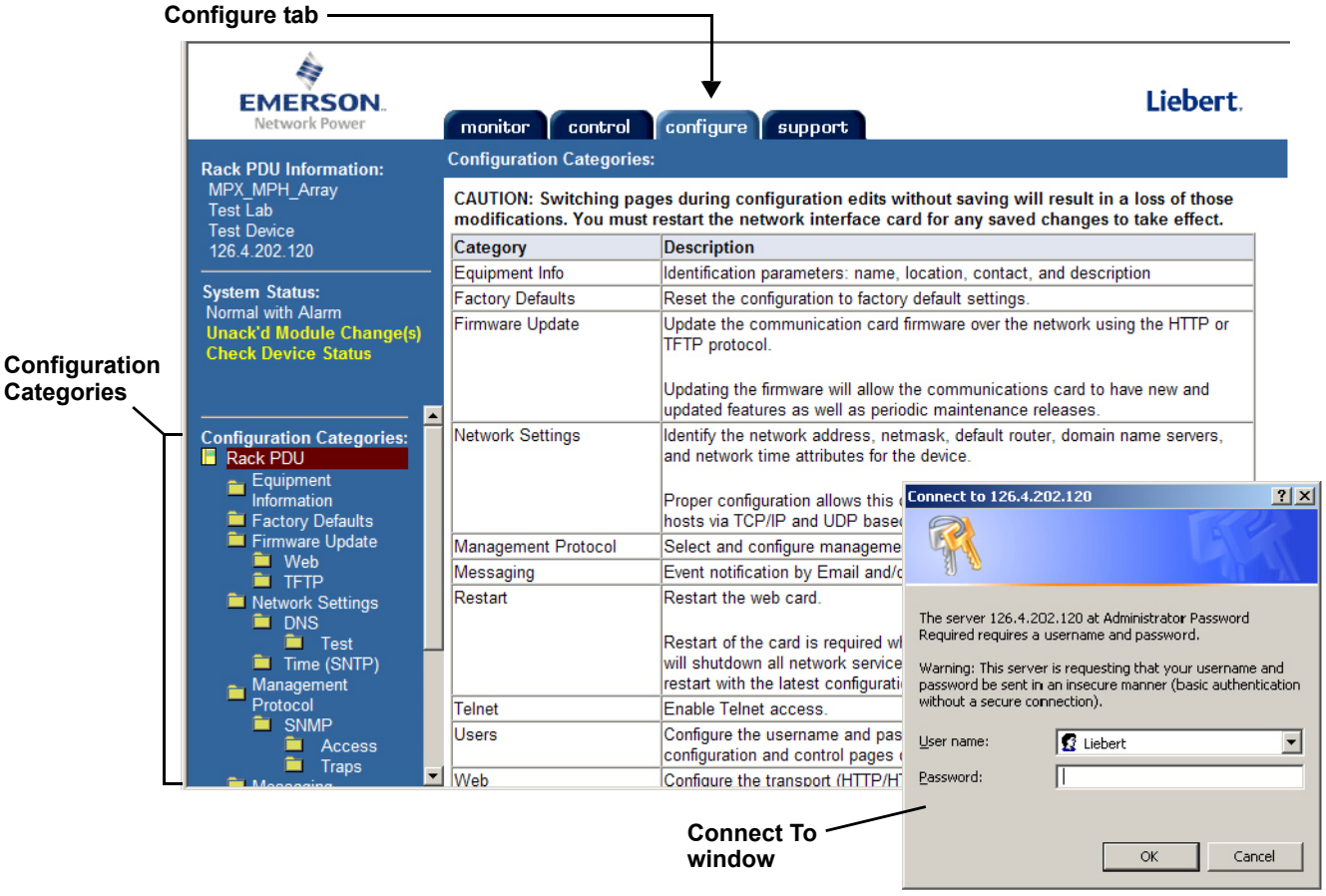
For configuration options:

- Access to configuration functions requires a username and password (see **9.1 - Enter Login Information**).
- Some changes—Rack PDU Information, SNMP configuration, Rack PDU Array configuration—are not saved until the card is rebooted (see **9.2 - Restarting the Liebert RPC Card**).
- See the following sections for details on configuration functions:
  - **9.1 - Enter Login Information**
  - **9.2 - Restarting the Liebert RPC Card**
  - **9.3 - Equipment Information**
  - **9.4 - Reset to Factory Defaults**
  - **9.5 - Network Settings - Network Access Parameters**
  - **9.6 - Management Protocol**
  - **9.7 - Messaging**
  - **9.8 - Change Username / Password**
  - **9.9 - Web Server**
  - **9.10 - Rack PDU Array**
- For details on Firmware Update**,** see **13.0 - Firmware Upgrade.**

9.1 Enter Login Information

To access configuration functions, log in with the Administrator username and password:

1. Open a Web browser such as Internet Explorer, then enter the IP address or hostname of the Liebert RPC card in the address bar—e.g., **http://192.168.0.125**.
2. Click on the **Configure** tab. The left pane displays Configuration Categories, organized with folder icons.



3. Click on any configuration category, and the Connect To window opens.
4. Enter the Administrator username and password (both case-sensitive):
   a. **User Name** (default is *Liebert*)
   b. **Password** (default is *Liebert*)

NOTE

For security, change the default username and password. To do this:

- *Click on the **Configure** tab, then **Users** in the left pane and finally **Edit** in the right pane.*
- *See **9.8 - Change Username / Password** for details.*

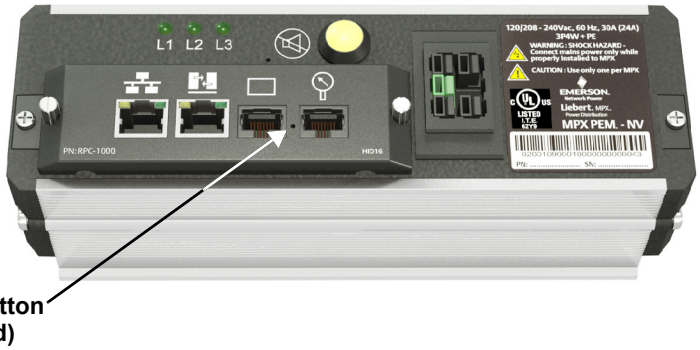
5. Click **OK**.
6. Refer to the remainder of this section for details on each function.
7. After making changes, click the **Save** button.
8. In addition to clicking the **Save** button, restart the Liebert RPC when a Restart notice appears. See **9.2 - Restarting the Liebert RPC Card** for details on this required step.

9.2 Restarting the Liebert RPC Card

Restarting the Liebert RPC card is required when a Restart notice appears after some configuration changes. In these cases, changes will NOT take effect until the Liebert RPC card is reinitialized. The card may be restarted either manually or through the card's Web interface.

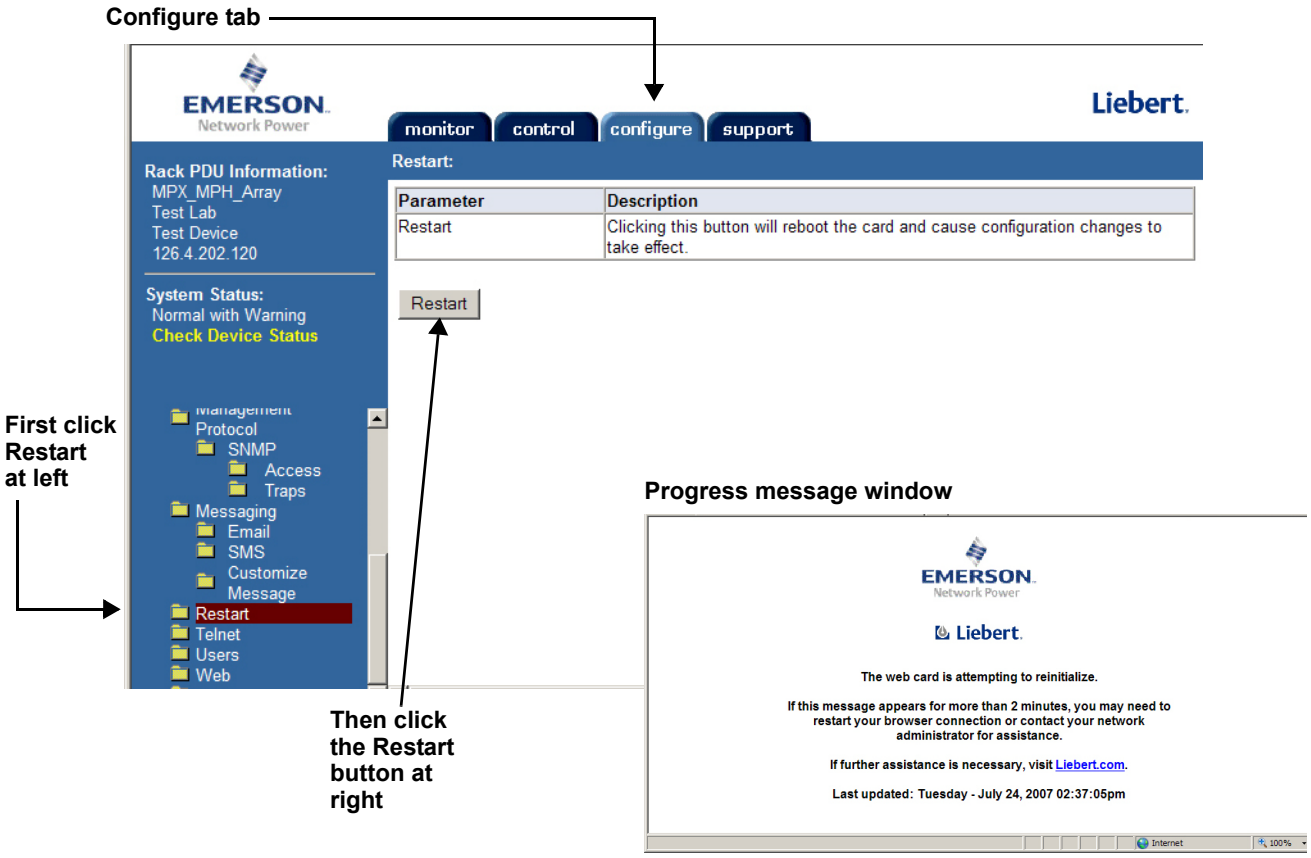
To restart the card manually, insert a small, straight probe or piece of wire into the card and hold the reset button down for 5 seconds. See **Figure 10** for the reset button's location.

Figure 10 Reset button location



To restart the card through the card's Web interface:

- In the Configure tab window (below left), click **Restart** in the left pane.
- Click the **Restart** button at right to reboot the Liebert RPC card and put your changes into effect.



- A message window appears, shown above right, and remains until the card is reinitialized.

9.3 Equipment Information

Rack PDU Information is optional and identifies the Liebert unit, its location, a contact person and other information about the unit. The default value of each field is "Uninitialized."

NOTE
This information also configures the SNMP parameters sysName, sysContact, sysDescr and sysLocation available using RFC-1213 MIB II.

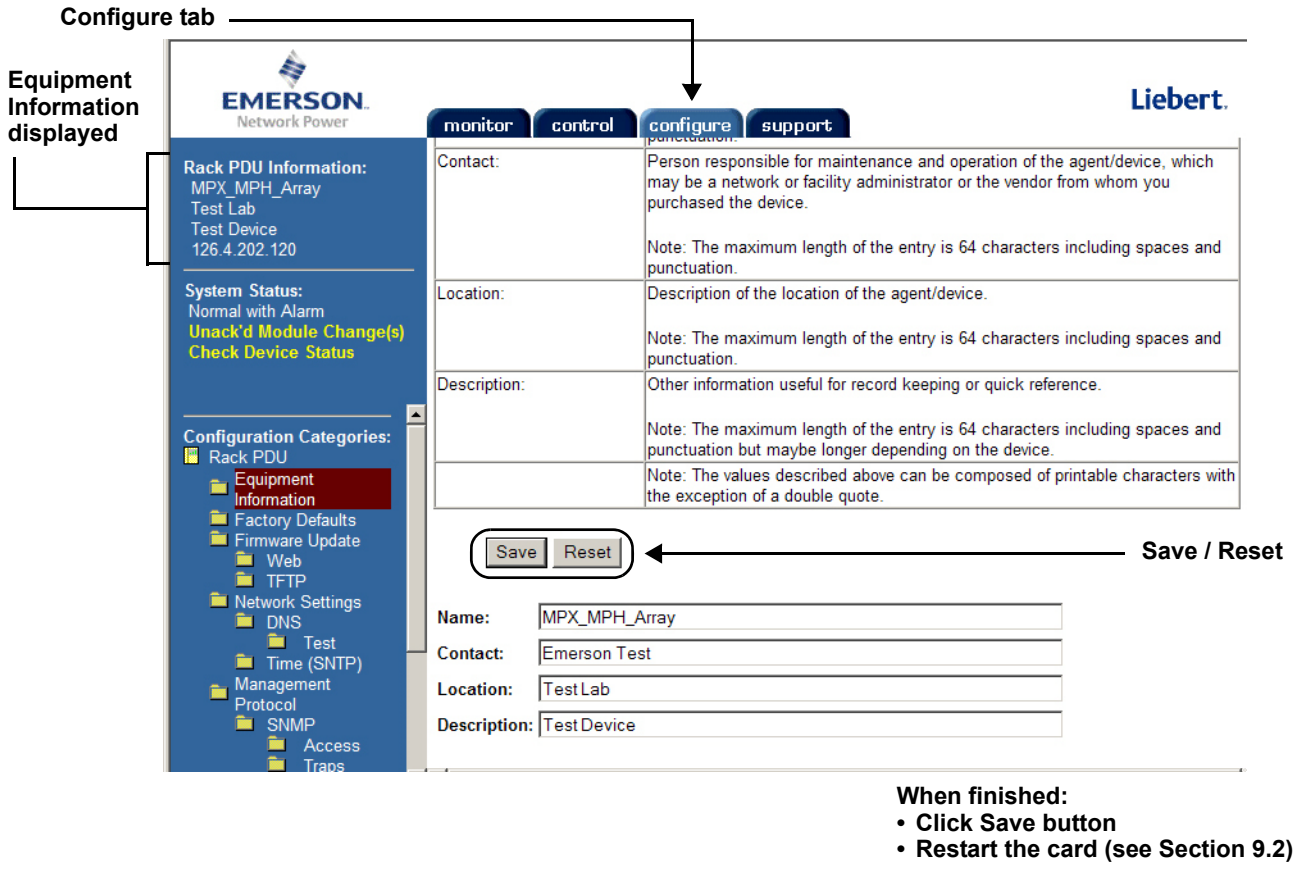
To make changes to the Rack PDU Information:

- Click on the **Configure** tab, then **Equipment Information** in the left pane.
- Click the **Edit** button in the right pane.
- Enter the identifying information, using the following as a guide.

Item	Description	Maximum Length
Name	A name for the Liebert unit	255 characters*
Contact	A contact person or department responsible for maintenance and operation of the Liebert unit	64 characters*
Location	The location of the Liebert unit	64 characters*
Description	Other useful information about the unit for quick reference	64 characters*

* Valid characters include spaces and other printable characters except double quotes (").

- After making changes, click **Save**.
- These changes require restarting the Liebert RPC card. Follow the instructions in **9.2 - Restarting the Liebert RPC Card**. Changes will not take effect until this step is completed.



9.4 Reset to Factory Defaults

Factory default values may be restored for all configuration settings, either manually or through the Web interface.

NOTE

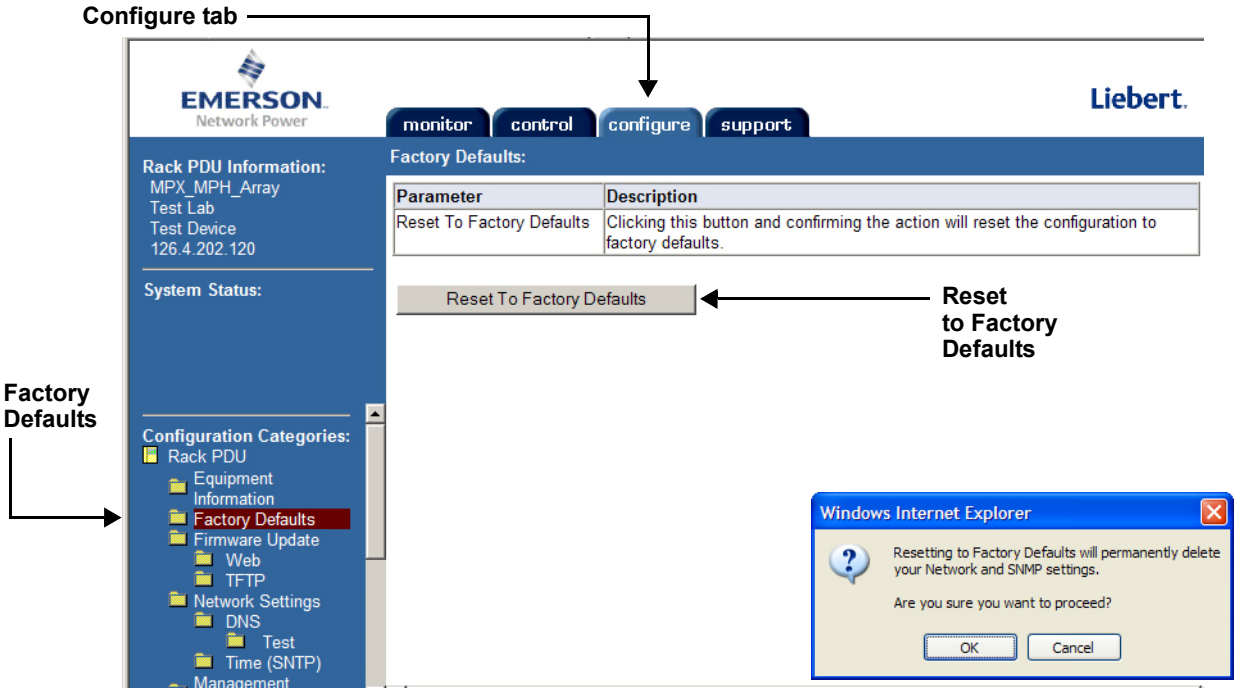
Before performing this reset action, be aware that this step:

- *Replaces **ALL** user-defined settings described in this manual.*
- *Restores DHCP service, the factory default, replacing a static IP address or hostname, if configured during installation.*

To restore the factory default settings manually, press the reset button five times within 10 seconds. Insert a small probe or piece of wire into the hole on the front of the card to access the recessed reset button. See **Figure 10** for the button's location.

To restore the factory default settings through the Web interface:

- Click on the **Configure** tab, then **Factory Defaults** in the left pane.
- When ready to proceed, click the **Reset to Factory Defaults** button in the right pane.



- Click **OK** at the prompt to confirm your choice. (Or **Cancel** to close without resetting.)

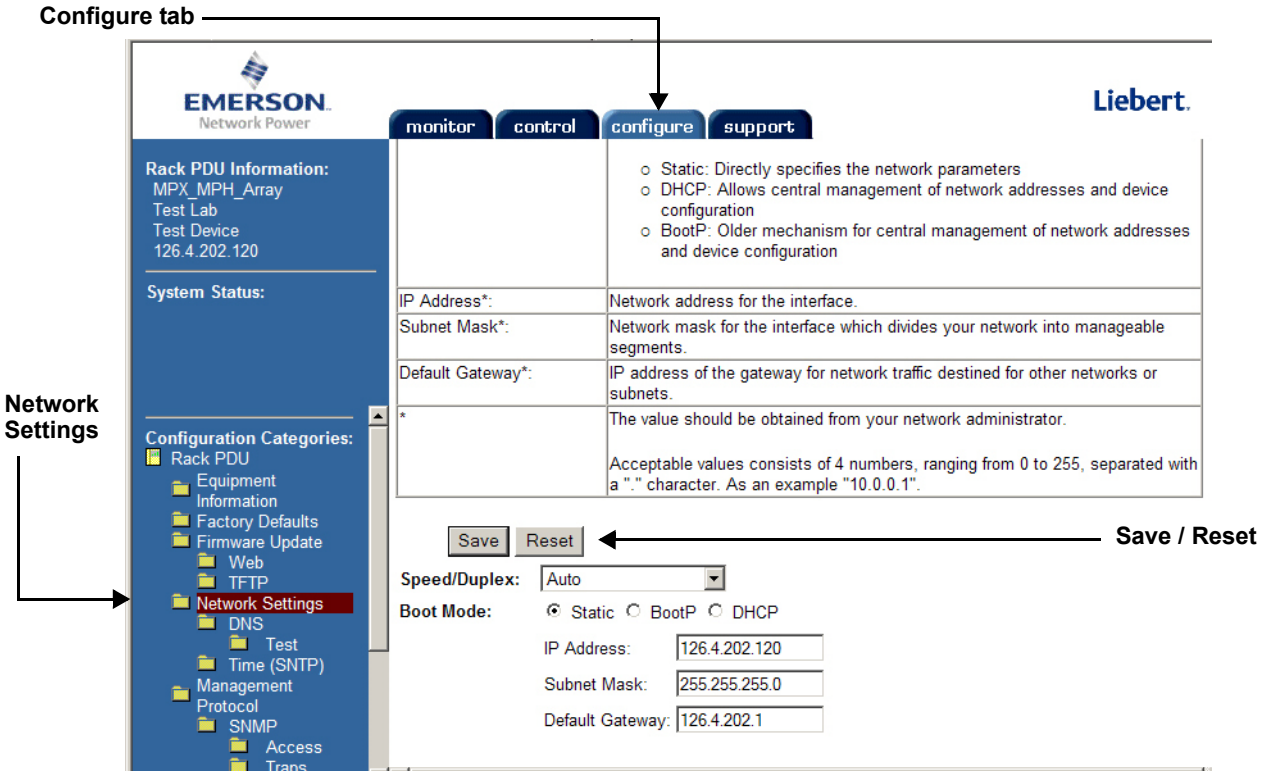
9.5 Network Settings - Network Access Parameters

The Network Settings menu is used to set parameters for network access to the Liebert RPC card. Consult your network administrator for these settings.

9.5.1 Network Access Parameters

To access Network Settings:

- Click on the **Configure** tab, then **Network Settings** in the left pane and finally **Edit** below the table of parameters and descriptions.



- Use the following guide to change options as needed—for example, **Speed/Duplex**.
- After making changes, click **Save**.

Table 31 Boot/IP settings range

Parameter	Description & Valid Settings*
Speed/ Duplex	Speed and duplex configuration of the Ethernet port. • Auto *(default—use this setting if unknown)* • 10Mbs/Half Duplex • 100Mbs/Half Duplex • 10Mbs/Full Duplex • 100Mbs/Full Duplex
Boot Mode	Startup mode enabling the Liebert RPC card to be a network-ready device. • **Static** - Fixed network addresses and other parameters • **DHCP** - Central management using dynamic network addresses • **BootP** - Older mechanism for central management of network addresses
IP address	Network address for the Liebert unit. Four numbers (0-255) separated by periods (.)—for example, 10.0.0.5
Subnet Mask	Network mask that divides your network into manageable segments. Four numbers (0-255) separated by periods (.)—e.g., 255.255.255.0
Default Gateway	IP address of the gateway for network traffic to other networks or subnets. Four numbers (0-255) separated by periods (.)—e.g., 10.0.0.1

* Consult your network administrator for proper settings.

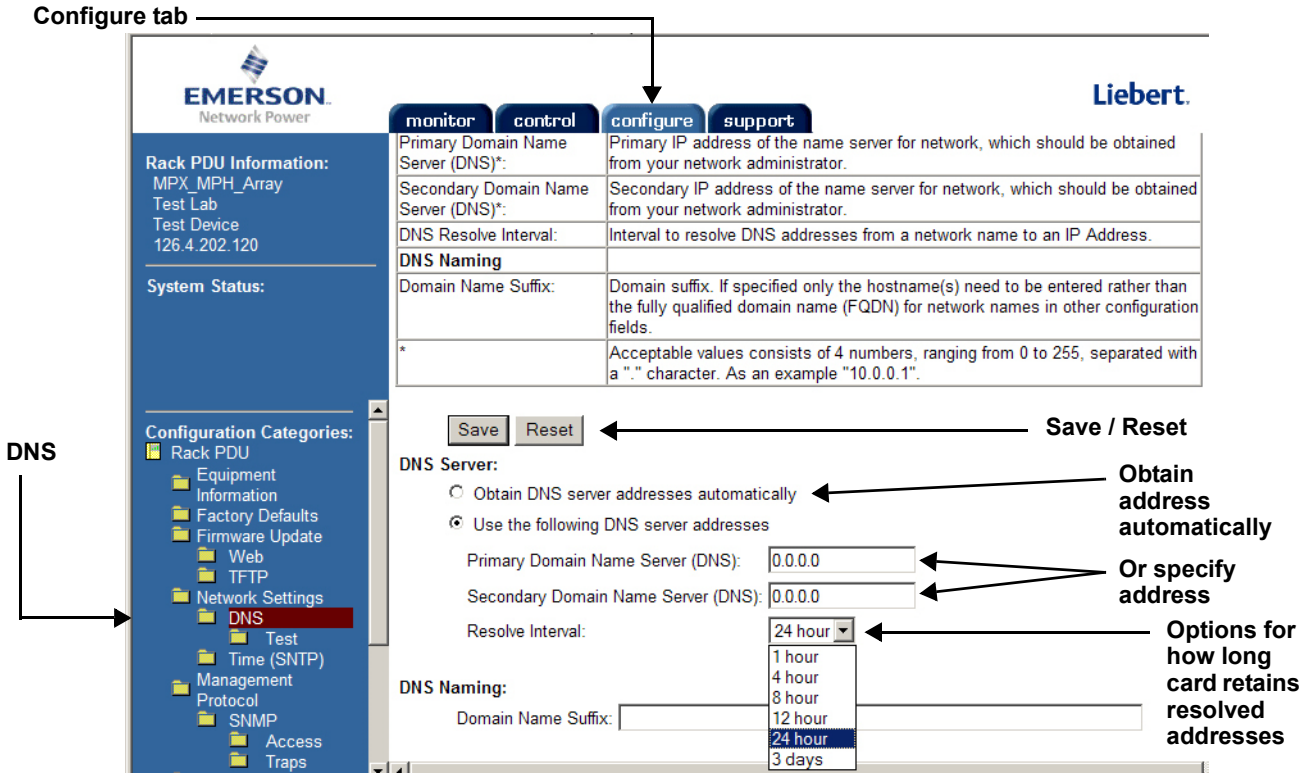
9.5.2 Network Settings - Domain Name Server (DNS) Settings

The Domain Name Server settings menu configures the servers the Liebert RPC card will use for hostname resolution. When configured, host addresses for SNMP, Network Time and Email/SMS can be specified in either full Domain Name format or host-only format, provided that the appropriate Domain Name Suffix is used.

The DNS menu is used to set parameters for network access to the Liebert RPC card. Consult your network administrator for these settings.

To access the DNS menu:

- Click on the **Configure** tab, then **DNS** in the left pane and finally **Edit** below the table of parameters and descriptions.



- Use the following guide to change options as needed—for example, **DNS Mode**.
- After making changes, click **Save**.

Table 32 Domain Name Server settings

Parameter	Description & Valid Settings*
DNS Mode	Obtain DNS server addresses automatically or use specified addresses. Note: Automatic assignment option is available only if a DHCP server is used to assign IP information to the Liebert RPC card.
Primary DNS	Primary IP address of the name server for network.* Four numbers (0-255) separated by periods (.)—e.g., 192.168.0.1
Secondary DNS	Secondary IP address of the name server for network.* Four numbers (0-255) separated by periods (.)—e.g., 192.168.0.1
DNS Resolve Interval	Interval to resolve DNS addresses from a network name to an IP address.
Domain Name Suffix	This suffix is used for assembling a fully qualified domain name when a host-only name is specified.

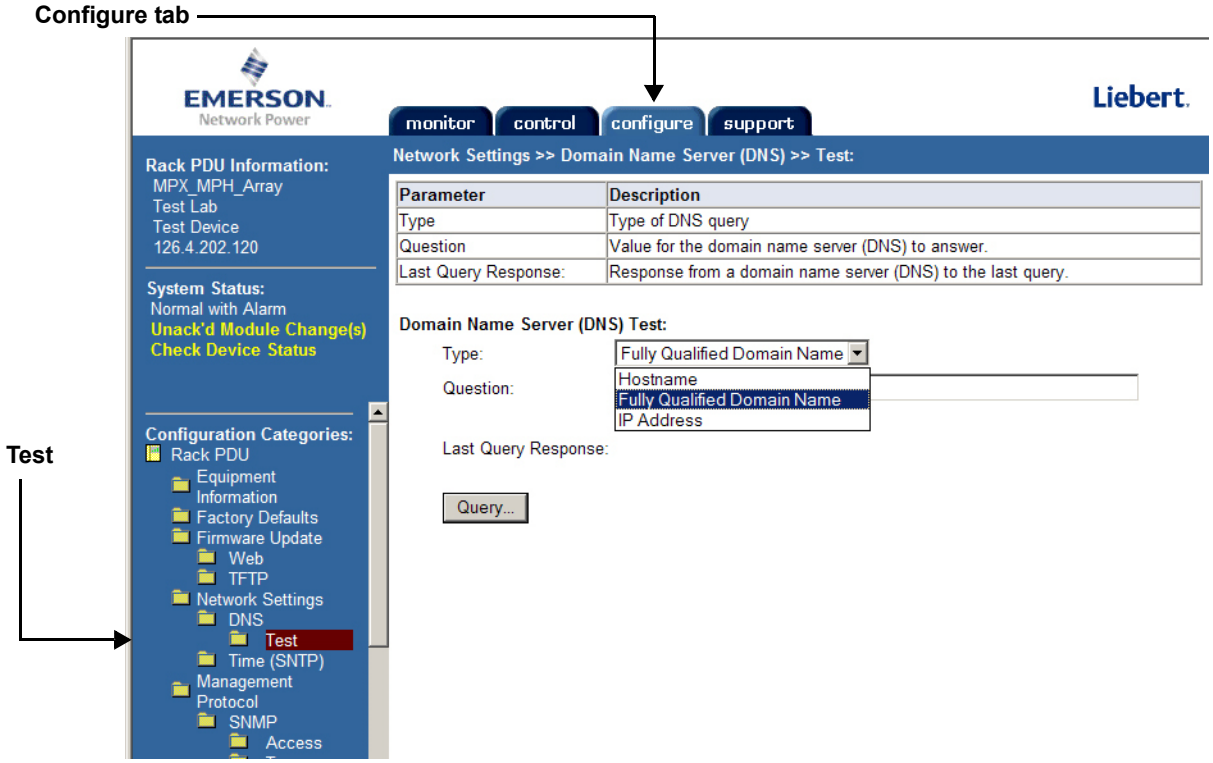
* Consult your network administrator for proper settings.

9.5.3 Network Settings - DNS Test

The DNS Test function checks whether the Liebert RPC card will resolve a hostname to an IP address. Provide a host-only name, a fully qualified domain name or an IP address, click on **Query** for the card to attempt a lookup with the provided information.

To access the DNS Test function:

- Click on the **Configure** tab, then **Test** in the left pane.



- Use the following guide to change options as needed—for example, **Type**.
- When ready, click the **Query** button to initiate a lookup.

Table 33 Domain Name Server settings

Parameter	Description & Valid Settings*
Type	Specifies the type of DNS query. The options are Hostname, Fully Qualified Domain Name or IP Address.
Question	Value for the DNS to answer.
Last Query Response	Response from the DNS to the last query.
Query button	Click this button to initiate a lookup based on the parameters specified on this page.

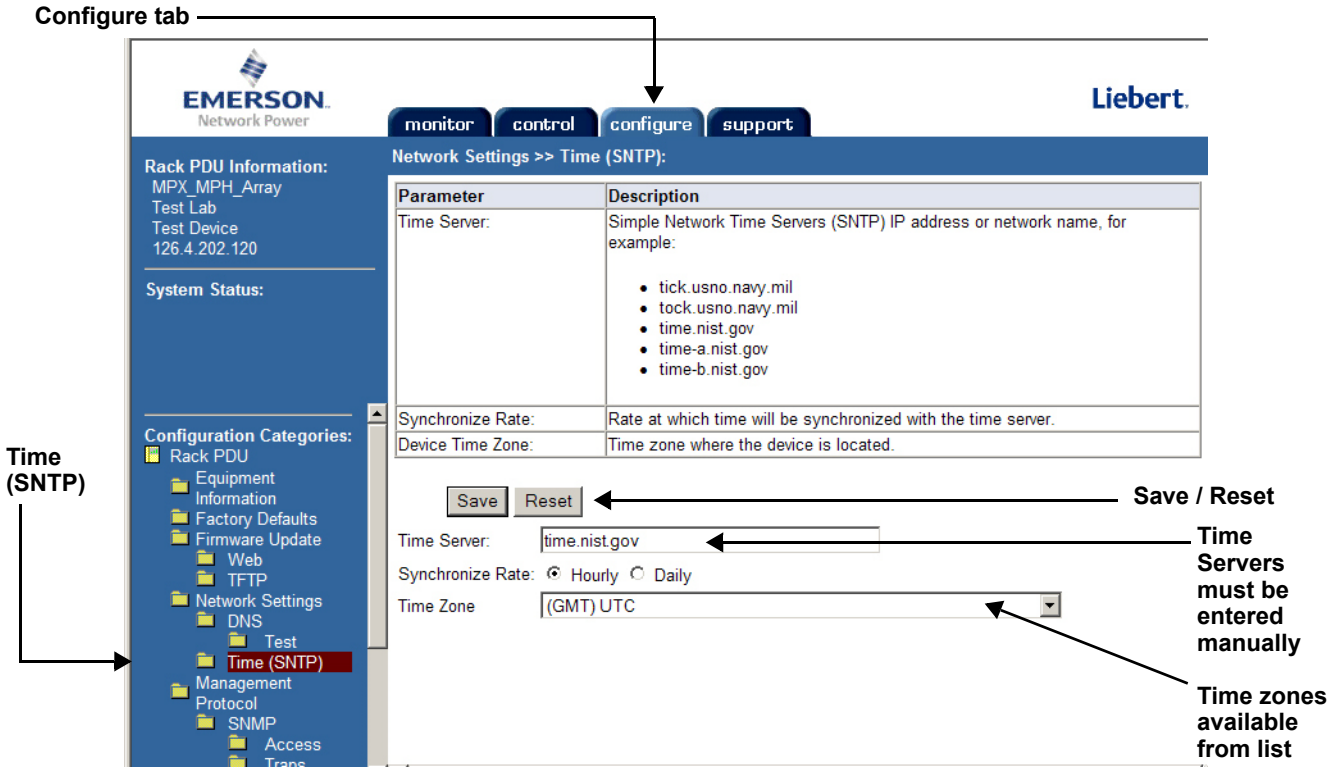
* Consult your network administrator for proper settings.

9.5.4 Time (SNTP) Menu

This permits setting time options—how often the Liebert RPC card synchronizes with the Time Server, which Time Server to use for synchronization and which Time Zone the card is operating in.

To access Time (SNTP) settings:

- Click on the **Configure** tab, then **Network Settings** in the left pane.
- Click on **Edit** in the right pane.



- Use the following guide to change options as needed—for example, Time Server.
  - In the Time Server box, specify the new time server, if desired.
  - If needed, change the Synchronize Rate to **Hourly** or **Daily**.
  - Choose Time Zone, select a region from the list and then select a time zone.
- After making changes, click **Save**.

Table 34 Time Server parameters

Parameter	Description
Time Server	This is the server that will be used for synchronization. This can be either an IP address or a hostname, provided that the DNS options are configured.
Synchronize Rate	This is how often the card will attempt to synchronize its internal clock with the specified time server.
Time Zone	This is the local Time Zone that will be used to correctly adjust the time provided by the server for the locale where the Liebert RPC card is being used.

9.6 Management Protocol

The Management Protocol Menu allows enabling or disabling SNMP, choosing SNMP v1/v2c or SNMPv3 and configuring management protocols. Consult your network administrator for these settings.

To enable or disable the Velocity Server or the SNMP Network Agent:

- Click on the **Configure** tab, then **Management Protocol** in the left pane and finally **Edit** in the right pane.
- Check (✔) the enabled box to activate **Velocity Server** or **SNMP Agent**. (To disable a protocol, click to remove the check mark.) Refer to **Table 35**.
- After making changes, click **Save**.

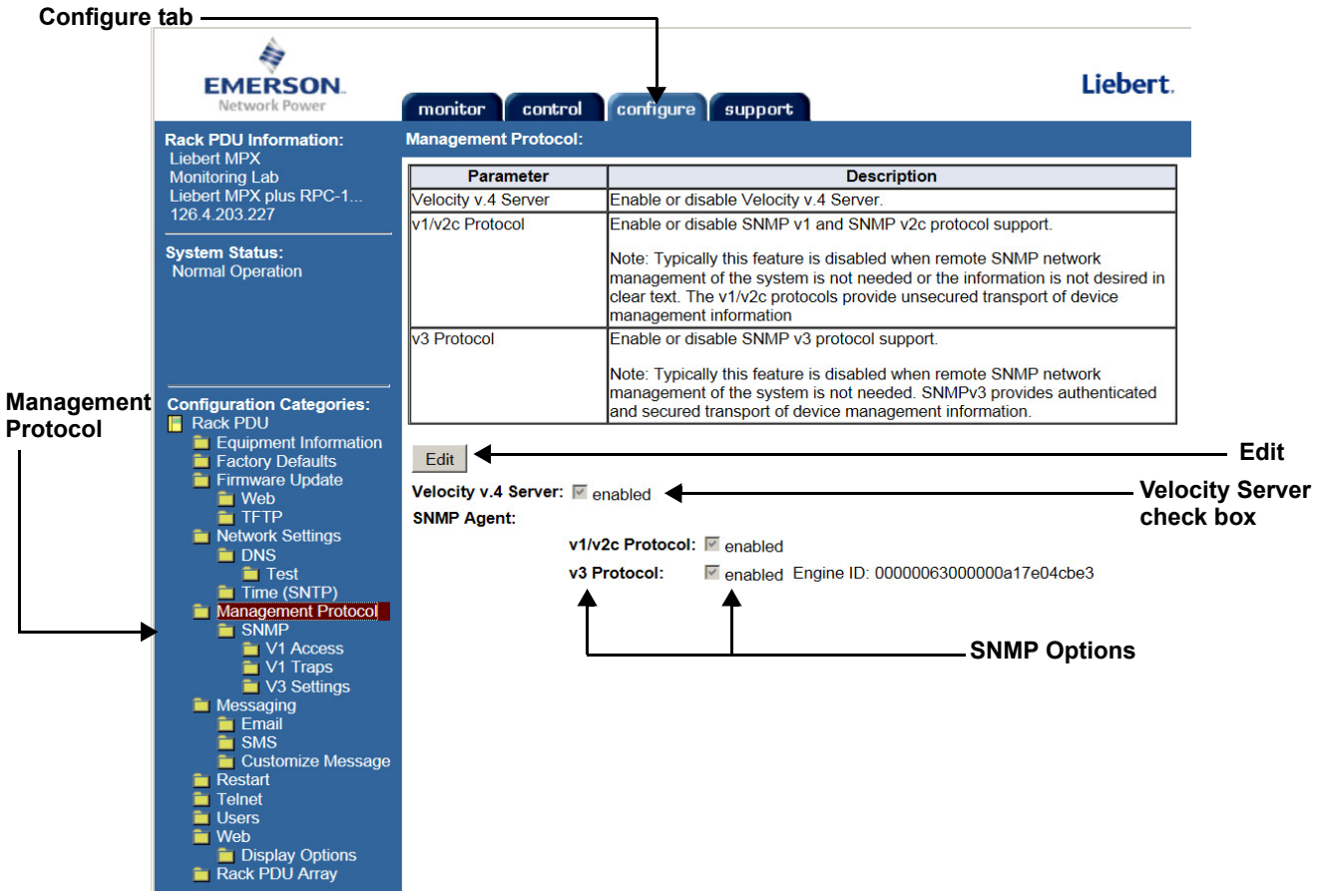


Table 35 Management protocol parameters

Parameter	Description
Velocity Server	Enable or disable Velocity server access.
SNMP Agent	Enable or disable SNMPv1/v2c or SNMPv3 for remote management.

9.6.1 SNMP Menu

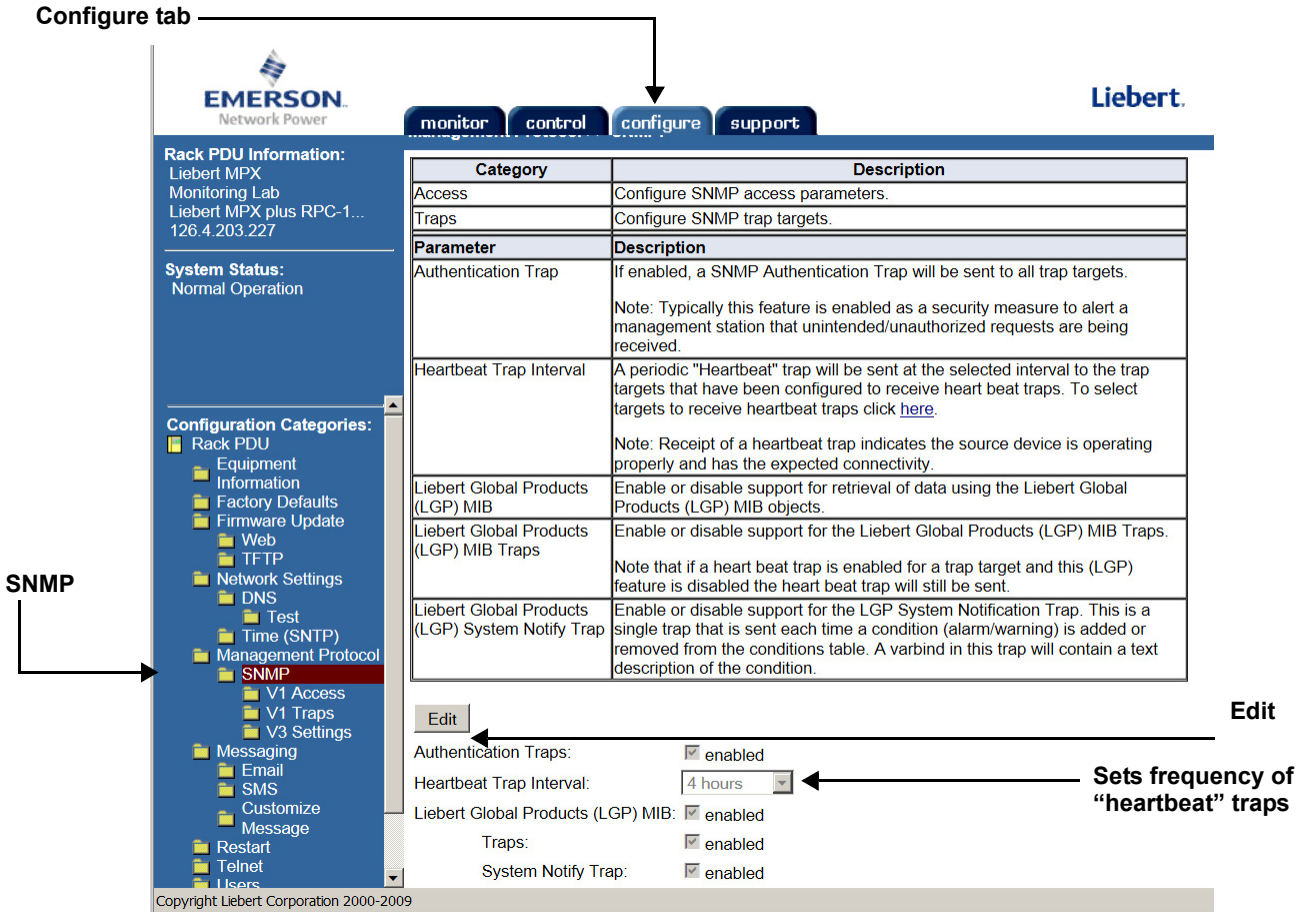
Use the SNMP Menu to enable authentication traps and view or change communities and trap communities, events and parameters.

Refer also to the following sections:

- **Section 9.6.3 - SNMP - V1 Access**
- **Section 9.6.4 - SNMP V1 Traps**
- **Section 10.2 - Events and Parameters** (to view available SNMP events and parameters)

To access SNMP settings:

- Click on the **Configure** tab, then **SNMP** in the left pane and finally **Edit** in the right pane.


Configure tab
EMERSON Network Power
Liebert
monitor
control
configure
support
Rack PDU Information:
Liebert MPX
Monitoring Lab
Liebert MPX plus RPC-1...
126.4.203.227
System Status:
Normal Operation
Configuration Categories:
Rack PDU
Equipment Information
Factory Defaults
Firmware Update
Web
TFTP
Network Settings
DNS
Test
Time (SNTP)
Management Protocol
SNMP
V1 Access
V1 Traps
V3 Settings
Messaging
Email
SMS
Customize Message
Restart
Telnet
Users
Category
Description
Access
Configure SNMP access parameters.
Traps
Configure SNMP trap targets.
Parameter
Description
Authentication Trap
If enabled, a SNMP Authentication Trap will be sent to all trap targets.
Note: Typically this feature is enabled as a security measure to alert a management station that unintended/unauthorized requests are being received.
Heartbeat Trap Interval
A periodic "Heartbeat" trap will be sent at the selected interval to the trap targets that have been configured to receive heart beat traps. To select targets to receive heartbeat traps click here.
Note: Receipt of a heartbeat trap indicates the source device is operating properly and has the expected connectivity.
Liebert Global Products (LGP) MIB
Enable or disable support for retrieval of data using the Liebert Global Products (LGP) MIB objects.
Liebert Global Products (LGP) MIB Traps
Enable or disable support for the Liebert Global Products (LGP) MIB Traps.
Note that if a heart beat trap is enabled for a trap target and this (LGP) feature is disabled the heart beat trap will still be sent.
Liebert Global Products (LGP) System Notify Trap
Enable or disable support for the LGP System Notification Trap. This is a single trap that is sent each time a condition (alarm/warning) is added or removed from the conditions table. A varbind in this trap will contain a text description of the condition.
Edit
Edit
Authentication Traps: enabled
Heartbeat Trap Interval: 4 hours
Sets frequency of "heartbeat" traps
Liebert Global Products (LGP) MIB: enabled
Traps: enabled
System Notify Trap: enabled
SNMP
Copyright Liebert Corporation 2000-2009

- Use the following guide to change options as needed—for example, **Authentication Traps**.
- After making changes, click **Save**.

Table 36 SNMP communications menu

Parameter	Description
Authentication Traps	If enabled, an SNMP Authentication Trap will be sent to all trap targets. Typically this feature is enabled as a security measure to alert a management station that unintended/unauthorized requests are being received.
Heartbeat Trap Interval	Specifies how often a "heartbeat" trap will be sent to show that a device is online and functioning normally. Select an interval from the drop-down menu—1 minute to 24 hours—to send a periodic heartbeat trap to specified trap targets.
Liebert Global Products MIB	Enables the Liebert Global Products MIB (Enterprise Specific) for querying of information in that MIB. This option can be enabled or disabled independently of the RFC-1628 MIB.
Condition Traps	Enables event condition traps to be sent per the LGP MIB. The parent option must be enabled for this to also be enabled.
System Notify Trap	Enables system traps to be sent per the LGP MIB. The parent option must be also enabled for this to be enabled.

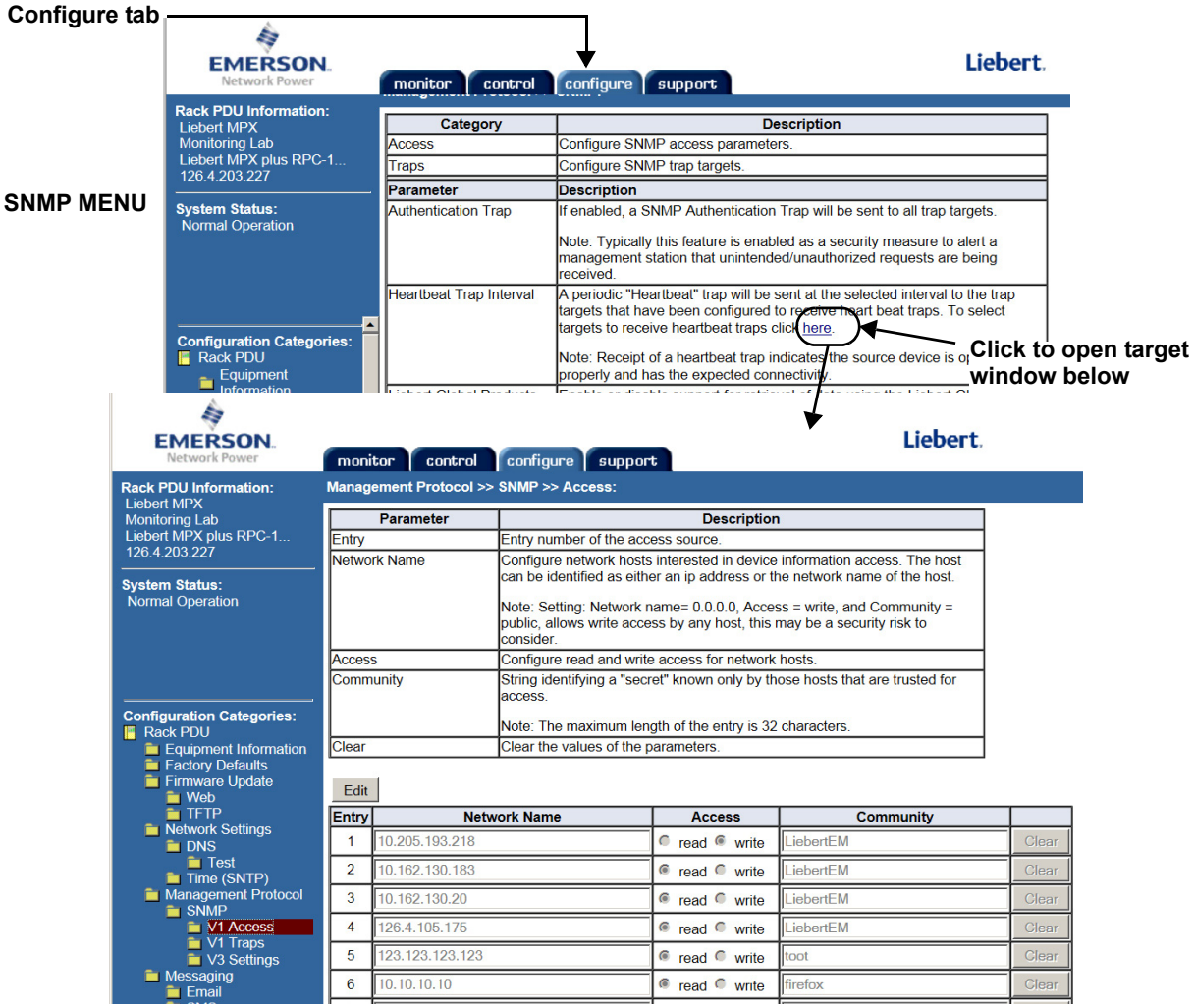
9.6.2 SNMP - Heartbeat Trap Targets

Use the "heartbeat" trap feature to send periodic traps to specified target devices to confirm they are operating properly.

Specify target devices according to the following steps, then refer to **9.6.1 - SNMP Menu** to specify the time interval for sending these periodic heartbeat traps.

To specify heartbeat trap targets:

- Click on the **Configure** tab, then **SNMP** in the left pane and finally **Edit** in the right pane.
- In the table, scroll to Heartbeat Trap Interval, then click on the "here" link, as shown below.



- Use the following guide to change options as needed—for example, **Network Name**.
- After making changes, click **Save**.

Table 37 SNMP heartbeat traps menu

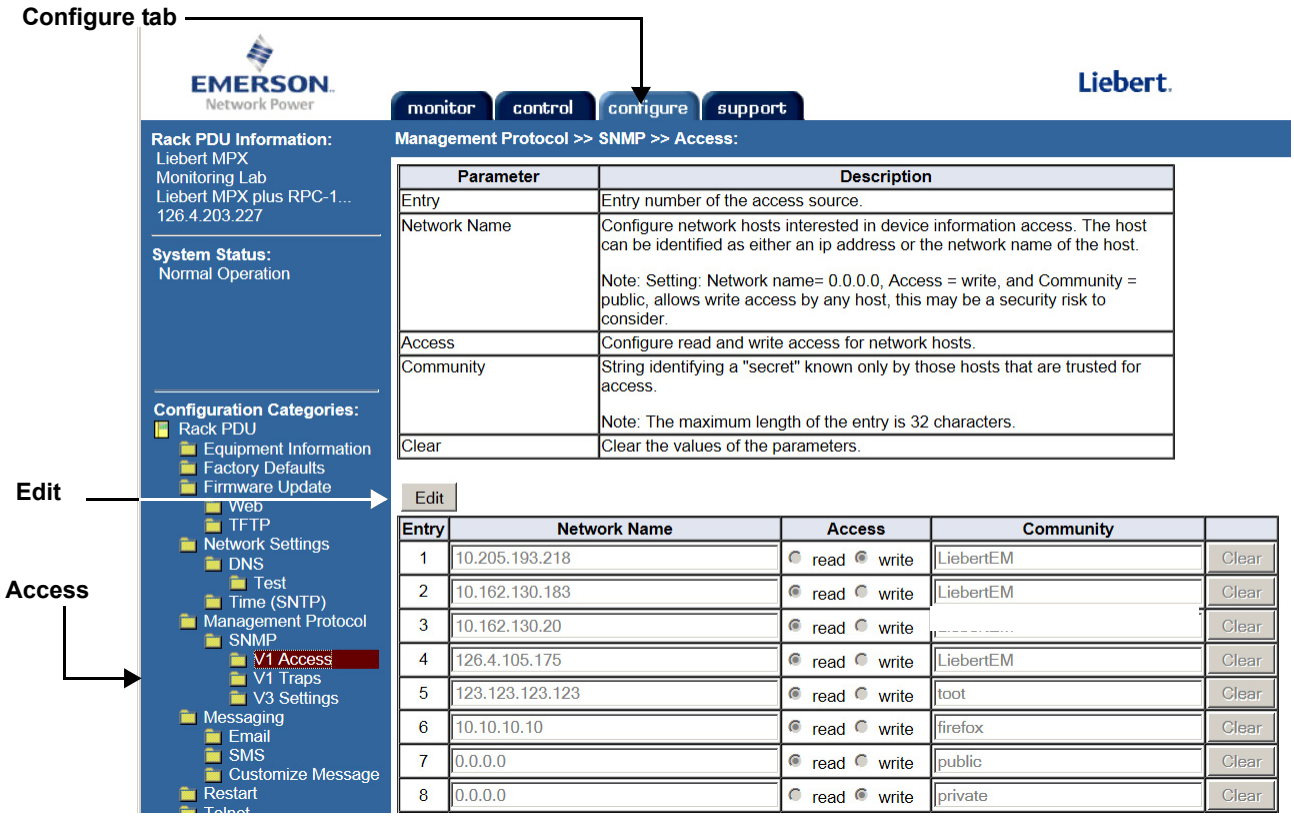
Parameter	Description
Entry	Enter up to 20 targets to receive heartbeat traps.
Network Name	The IP address or network name of the network host interested in device information access.
Port	The Trap Listen Port where traps will be sent; use 162 if the host computer uses standard ports (161/162).
Community	The community string used by the IP host for this entry (case-sensitive, up to 32 characters).
Heartbeat Target	Check the enable box to activate this feature for the target device. Click the **Test Heartbeat** button to send a test trap.
Clear	Delete all values for this entry.

9.6.3 SNMP - V1 Access

Use this menu to access SNMPv1/v2c Communities settings. Up to 20 devices can be configured with permission to access the Liebert RPC card, identified by IP address or hostname, read/write privileges and community string.

To specify devices for access:

- Click on the **Configure** tab, then **V1 Access** in the left pane and finally **Edit** in the right pane.



- Use the following guide to change options as needed—for example, **Network Name**.
- After making changes, click **Save**.

Table 38 SNMP v1 access menu

Parameter	Description
Entry	Up to 20 devices may be configured for access.
Network Name	The IP address or network name of the target to receive traps.
Access	Click **read** to allow users to view but not change data. Click **write** to give full permission for configuration, control and viewing.
Community	The community string used by the IP host for this entry (case-sensitive, up to 32 characters).
Clear	Delete all values for this entry.

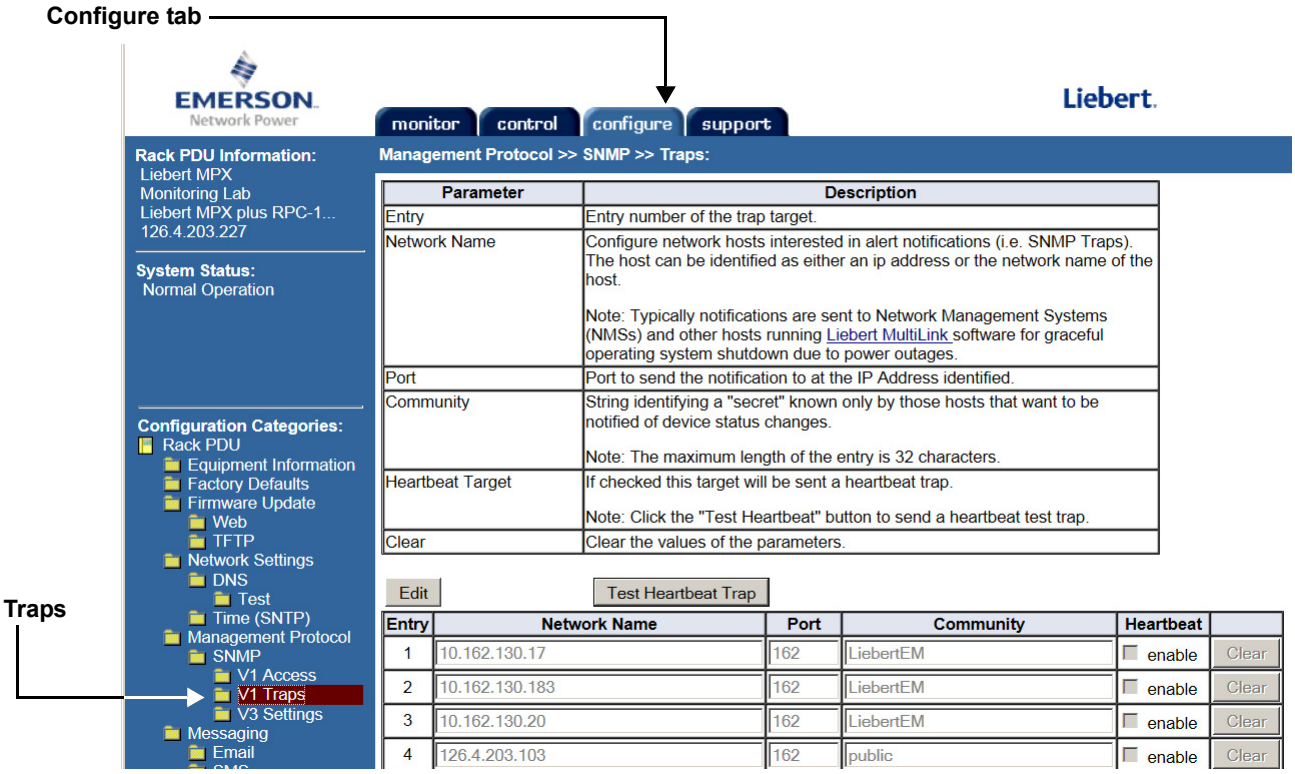
NOTE: Do **NOT** use the following setting, which allows write access by any host computer and may pose a security risk:
Network name= 0.0.0.0
Access = write
Community = public

9.6.4 SNMP V1 Traps

Use this menu to configure up to 20 users to receive notifications from the Liebert RPC card, identified by IP address or hostname, trap listen port and community string.

To specify devices for access:

- Click on the **Configure** tab, then **Traps** in the left pane and finally **Edit** in the right pane.



- Use the following guide to change options as needed—for example, **Network Name**.
- After making changes, click **Save**.

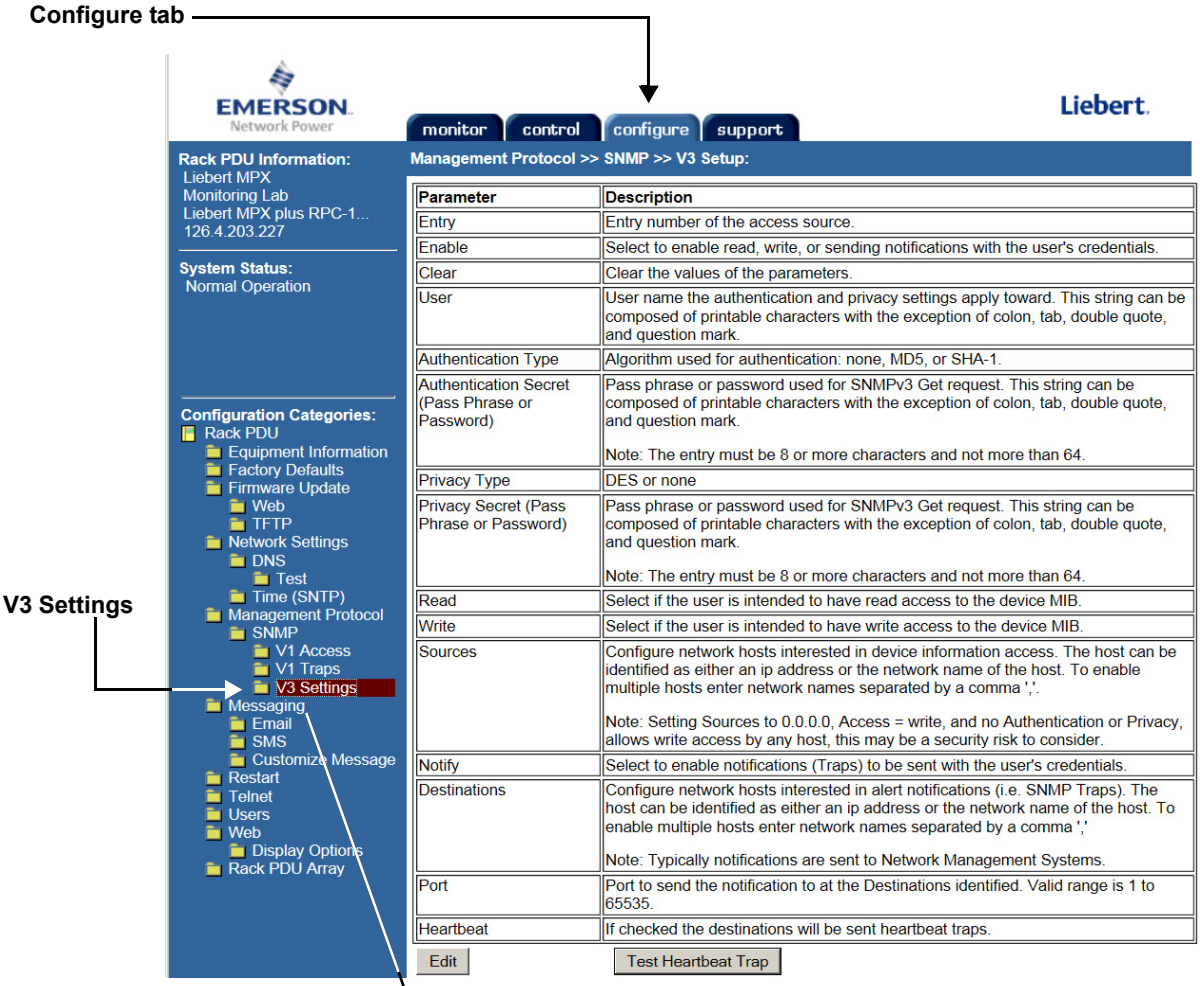
Table 39 SNMP traps menu

Parameter	Description
Entry	Enter up to 20 targets to receive traps.
Network Name	The IP address or network name of the target to receive traps.
Port	The Trap Listen Port where traps will be sent; use 162 if the host computer uses standard ports (161/162).
Community	The community string used by the IP host for this entry (case-sensitive, up to 32 characters).
Heartbeat Target	Check the enable box to activate this feature for the target device. Click the **Test Heartbeat** button to send a test trap.
Clear	Delete all values for this entry.

9.6.5 SNMP - V3 Settings

To access SNMPv3 settings:

- Click on the **Configure** tab, then **V3 Settings** (under Management Protocol) in the left panel.
- Put a check mark (✔) in the Enable box and enter a User Name. Complete the settings for each user who will have access.
- After making changes, click **Save**.


Configure tab
V3 Settings
Configure up to 20 users
EMERSON
Network Power
Liebert
monitor
control
configure
support
Rack PDU Information:
Liebert MPX
Monitoring Lab
Liebert MPX plus RPC-1...
126.4.203.227
System Status:
Normal Operation
Configuration Categories:
Rack PDU
Equipment Information
Factory Defaults
Firmware Update
Web
TFTP
Network Settings
DNS
Test
Time (SNTP)
Management Protocol
SNMP
V1 Access
V1 Traps
V3 Settings
Messaging
Email
SMS
Customize Message
Restart
Telnet
Users
Web
Display Options
Rack PDU Array
Management Protocol >> SNMP >> V3 Setup:
Parameter
Description
Entry
Entry number of the access source.
Enable
Select to enable read, write, or sending notifications with the user's credentials.
Clear
Clear the values of the parameters.
User
User name the authentication and privacy settings apply toward. This string can be composed of printable characters with the exception of colon, tab, double quote, and question mark.
Authentication Type
Algorithm used for authentication: none, MD5, or SHA-1.
Authentication Secret (Pass Phrase or Password)
Pass phrase or password used for SNMPv3 Get request. This string can be composed of printable characters with the exception of colon, tab, double quote, and question mark.
Note: The entry must be 8 or more characters and not more than 64.
Privacy Type
DES or none
Privacy Secret (Pass Phrase or Password)
Pass phrase or password used for SNMPv3 Get request. This string can be composed of printable characters with the exception of colon, tab, double quote, and question mark.
Note: The entry must be 8 or more characters and not more than 64.
Read
Select if the user is intended to have read access to the device MIB.
Write
Select if the user is intended to have write access to the device MIB.
Sources
Configure network hosts interested in device information access. The host can be identified as either an ip address or the network name of the host. To enable multiple hosts enter network names separated by a comma ','.
Note: Setting Sources to 0.0.0.0, Access = write, and no Authentication or Privacy, allows write access by any host, this may be a security risk to consider.
Notify
Select to enable notifications (Traps) to be sent with the user's credentials.
Destinations
Configure network hosts interested in alert notifications (i.e. SNMP Traps). The host can be identified as either an ip address or the network name of the host. To enable multiple hosts enter network names separated by a comma ','
Note: Typically notifications are sent to Network Management Systems.
Port
Port to send the notification to at the Destinations identified. Valid range is 1 to 65535.
Heartbeat
If checked the destinations will be sent heartbeat traps.
Edit
Test Heartbeat Trap
1 Enable:
User Name:
Authentication:
none MD5 SHA-1
Secret:
Privacy:
none DES
Secret:
Clear
Access: Read
Write
Sources:
Notify:
Destinations:
Heartbeat:
Port: 162
2 Enable:
User Name:
Authentication:
none MD5 SHA-1
Secret:
Privacy:
none DES
Secret:
Clear
Access: Read
Write
Sources:
Notify:
Destinations:
Heartbeat:
Port: 162

- Use the following guide to change options as needed—for example, **Network Name**.
- After making changes, click **Save**.

Table 40 SNMP V3 access menu

Parameter	Description
Enable	Enable must be checked for each user to be configured for access; maximum of 20 devices may be configured for access.
User Name	The IP address or network name of the network host to receive access to device information or traps.
Authentication	None / MD-5 / SHA-1
Secret	Authentication Password (8-64 characters) for SNMPv3 request
Privacy	None / DES
Secret	Privacy Password (8-64 characters) for SNMPv3 request
Access	Click **read** to allow users to view but not change data. Click **write** to give full permission for configuration, control and viewing.
Sources *	Either an IP address or the network name of the host. To enable multiple hosts enter network names separated by a comma ','.
Notify	Must be checked for the user to receive notifications from the card
Destinations	Configure each network host that will receive notifications from the card—Either an IP address or the network name of the host. To enable multiple hosts enter network names separated by a comma ','.
Heartbeat	Must be checked for the user to receive heartbeat traps from the card
Port	Default is 162
Clear	Delete all values for this entry.

Avoid the following setting—It permits access by any host and may pose a security risk:

Sources = 0.0.0.0
Access = Write
Authorization = none
Privacy = none

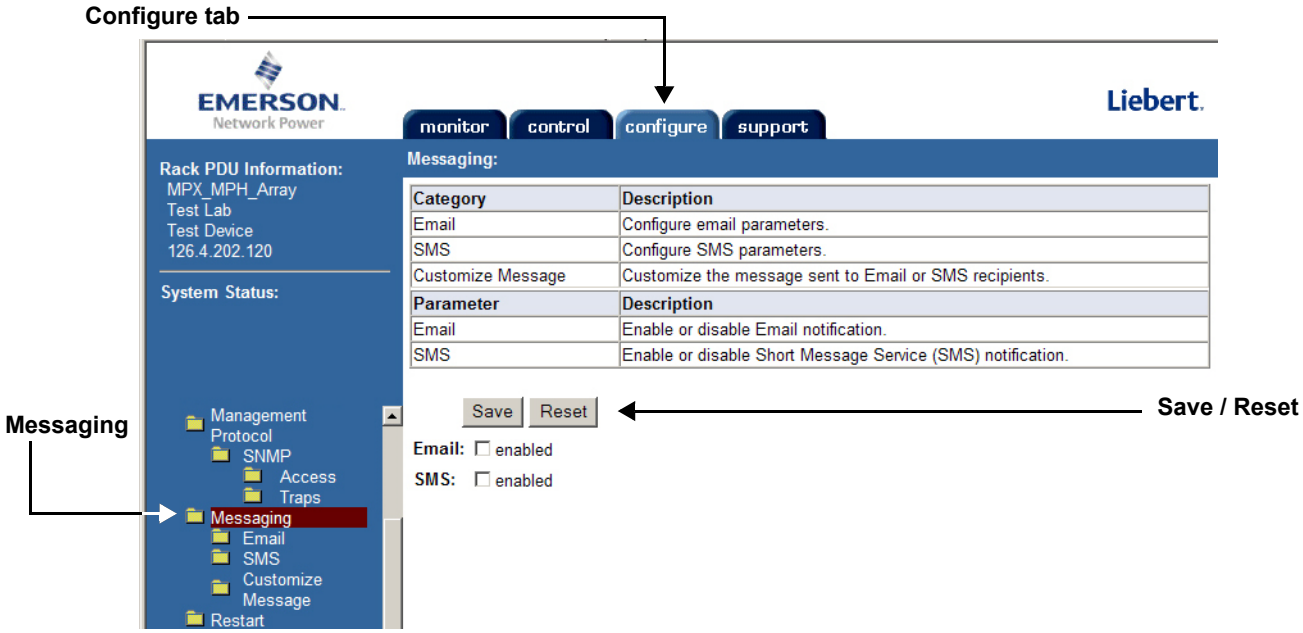
9.7 Messaging

Use the Messaging options to set up e-mail and text message notifications from the Liebert RPC. Each type of messaging must be enabled before it may be configured.

9.7.1 Enable Messaging

To enable Messaging features:

- Click on the **Configure** tab, then **Messaging** in the left pane.
- Click on **Edit** in the right pane.
- Activate a messaging option by placing a check mark (✔) in the enabled box (or deactivate by clicking to remove the check mark):
  - Email
  - SMS
- After making changes, click **Save**.



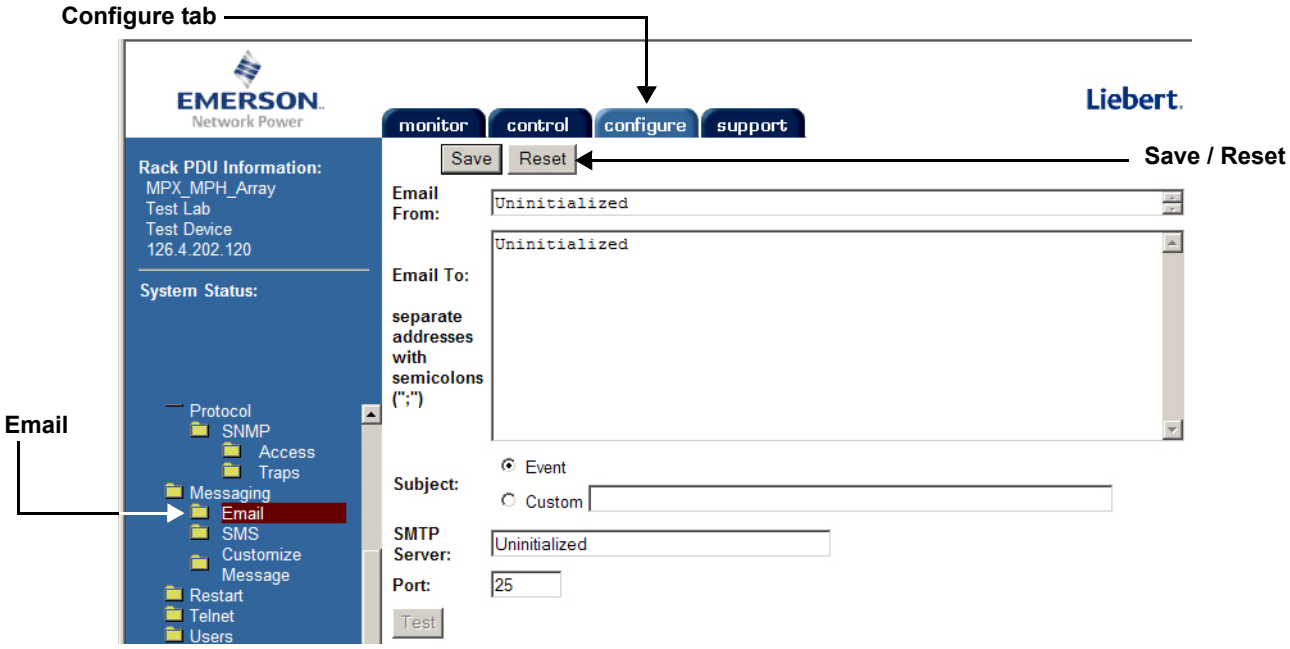
- Refer to the following sections to configure e-mail or SMS messages.
  - **9.7.2 - E-Mail Configuration**
  - **9.7.3 - SMS Configuration**
  - **9.7.4 - Customize Messages**

9.7.2 E-Mail Configuration

Setting up event notifications to be sent via e-mail involves two steps: enabling the function, then specifying the parameters.

To activate and set up e-mail messages:

- Activate the e-mail feature as described in **9.7.1 - Enable Messaging**.
- Click on the **Configure** tab, then **Email** in the left pane and finally **Edit** in the right pane.



- Use the following guide to change options as needed—for example, **Email From**.
- After making changes, click **Save**.

Table 41 E-mail configuration guide

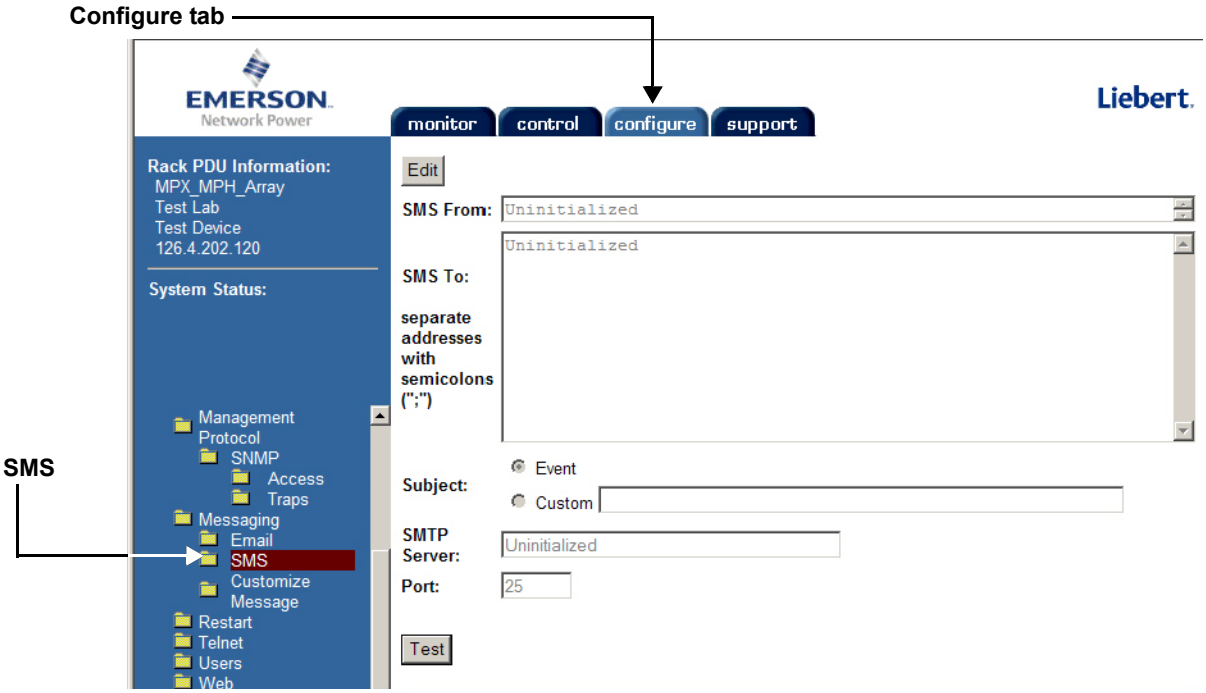
Parameter	Description	Maximum
Email From	The e-mail address of the sender—for example, *Support@company.com*—typically, the address where replies should be sent.	64 characters
Email To	The e-mail will be sent to this list of addresses. **NOTE:** To specify multiple recipients of the e-mail message, use a semicolon (;) to separate addresses—for example: **jsmith@abc.com;rjones@abc.com**.	64 characters
Subject	The subject line of the e-mail. • Click **Event** for the message to include the event description—e.g., *AlarmOnBypass*. • To customize the message, click the **Customize** button and refer to **9.7.4 - Customize Messages** for details.	120 characters
SMTP Server	The IP address or domain name of the SMTP e-mail server that sends messages.	32 characters
Port	SMTP server port—typically the default port, 25.	—
Test	After saving changes to e-mail parameters, send a test e-mail message to verify the settings are correct. The message status will be displayed.	—

9.7.3 SMS Configuration

Setting up event notifications for SMS text messages involves two steps: enabling the function, then specifying the parameters.

To activate and set up SMS messages:

- Activate the SMS feature as described in **9.7.1 - Enable Messaging**.
- Click on the **Configure** tab, then **SMS** in the left pane and finally **Edit** in the right pane.



- Use the following guide to change options as needed—for example, **SMS From**.
- After making changes, click **Save**.

Table 42 SMS configuration guide

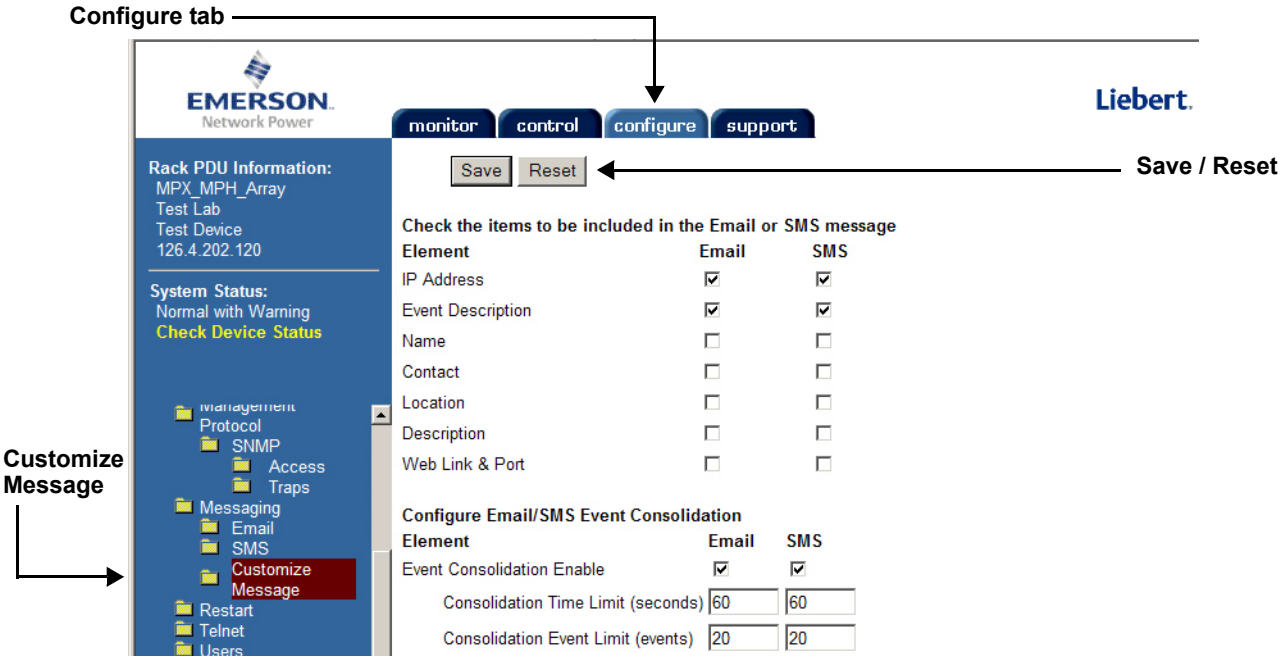
Parameter	Description	Maximum
SMS From	The e-mail address of the sender—for example, *Support@company.com*—typically, the address where replies should be sent.	64 characters
SMS To	The message will be sent to this list of addresses. The SMS/Text Message address is usually a 10-digit phone number followed by **@____.com** (where ____ might be a company name)—for example, **1112223333@abc.com**. **NOTE:** To specify multiple recipients of the e-mail message, use a semicolon (;) to separate addresses—e.g, **1112221111@abc.com;1112221111@xyz.com**.	64 characters
Subject	The subject line of the message. By default, this is the event description—e.g., *AlarmOnBypass*—but it may be customized.	120 characters
SMTP Server	The IP address or domain name of the SMTP e-mail server that sends messages.	32 characters
Port	SMTP server port—typically the default port, 25.	—
Test SMS	After saving changes to SMS parameters, send a test SMS message to verify the settings are correct. The message status will be displayed.	—

9.7.4 Customize Messages

Both e-mail and SMS text messages may be customized to include items such as the IP address or hostname, event name and a link to the Liebert RPC card in the body of the message.

To access Customize Message settings:

- Click the **Customize** button for the type of message to customize (see **9.7.2 - E-Mail Configuration** and **9.7.3 - SMS Configuration**).
- Click on the **Configure** tab, then **Customize Messages** (left pane) and **Edit** (right pane).



- Refer to the following guidelines and check (✔) items to include in each type of message in the Email and SMS columns.
- After making changes, click **Save**.

Table 43 E-mail and SMS message guidelines

Parameter	Description—if enabled, outgoing messages will include:	Defined in:
IP Address	The IP Address or Hostname of the Liebert RPC card.	**Section 9.5**
Event Description	Description of the SNMP event.	**Section 10.0**
Name	The name for the Liebert unit.	**Section 9.3**
Contact	The contact person or department.	**Section 9.3**
Location	The location of the Liebert unit.	**Section 9.3**
Description	Other information about the Liebert unit.	**Section 9.3**
Web Link & Port	A clickable link to the Liebert RPC card through the Web interface.	**Section 9.5**
	The port number of the SMTP server port.	**Section 9.7.2 Section 9.7.3**
Event Consolidation	Enable or disable this feature to include multiple events in e-mail/SMS notifications.	**Section 9.7.2 Section 9.7.3**
Consolidation Time Limit (seconds)	Duration (seconds) to consolidate events before a notification will be sent, regardless of event limit. Range: 10 to 120 seconds.	**Message Consolidation Time Limit and Message Consolidation Event Limit on page 59**
Consolidation Event Limit (events)	Number of events to consolidate before a notification will be sent, regardless of time limit. Range: 1 to 50 events.	**Message Consolidation Time Limit and Message Consolidation Event Limit on page 59**

Message Consolidation Time Limit and Message Consolidation Event Limit

Message Consolidation Time Limit allows adjusting the duration the card will wait for additional events before sending a notification E-mail. Consolidation event limit allows adjusting the number of events each E-mail will contain.

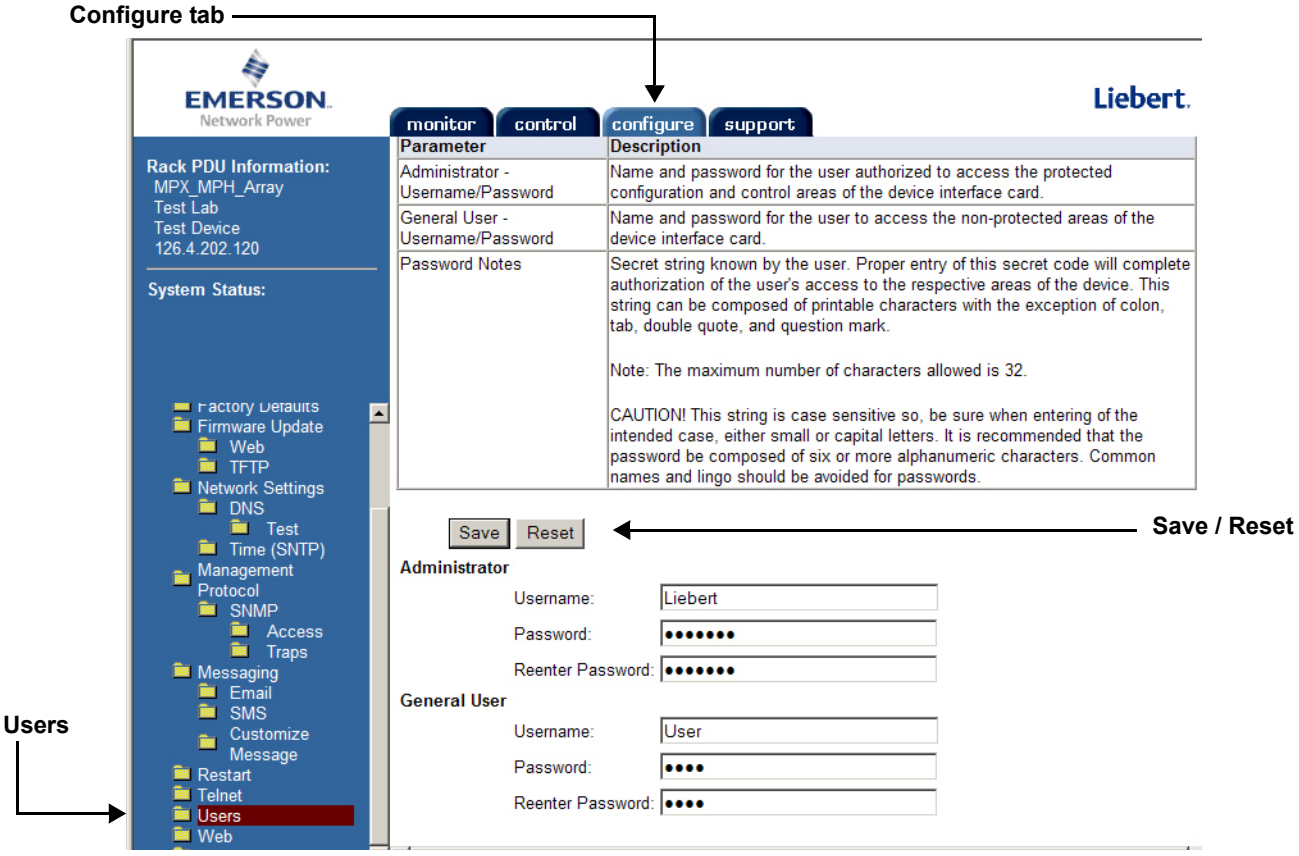
9.8 Change Username / Password

The Liebert RPC card has a default username and password. For security, be sure to change the default password. Two types of users may be configured, as described in the following table.

User	Factory Default		Description
Administrator	Username	Liebert	Full access to configuration and control functions, as well as viewing privileges
	Password	Liebert	
General User	Username	User	Viewing privileges only; no access to configuration or control functions
	Password	Liebert	

To access usernames and passwords:

- Click on the **Configure** tab, then **Users** in the left pane.



- Click the **Edit** button in the right pane.
- Follow these guidelines to change the username and password.

Maximum length	32 characters (6 or more characters recommended)
Valid characters	Any printable character EXCEPT colon, tab, double quote, question mark
Upper/lowercase	Case-sensitive—letters must be uppercase or lowercase as entered
Tips	Avoid common names, words and phrases as passwords

- After making changes, click **Save**.

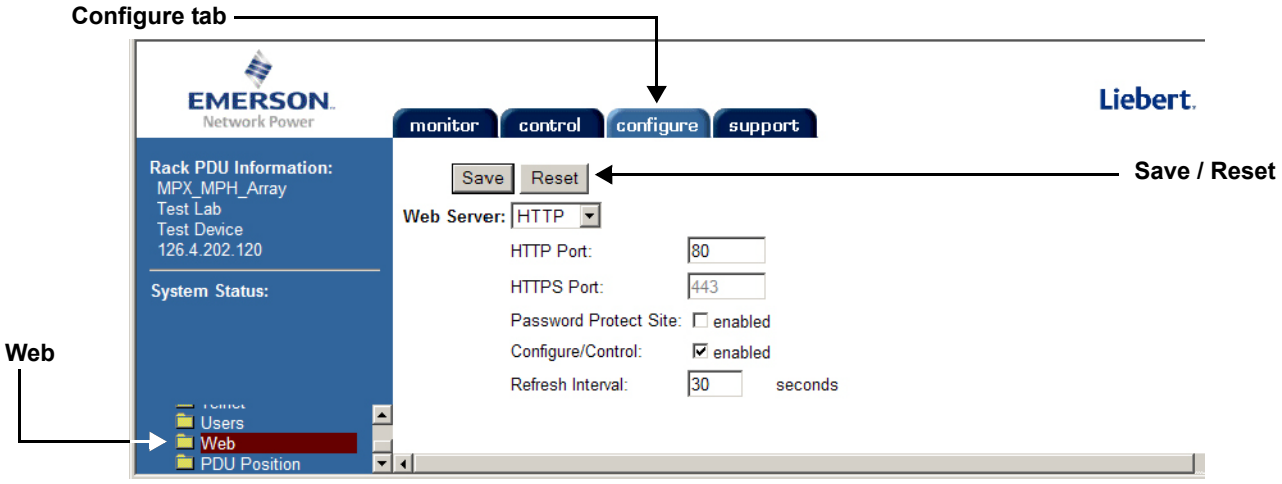
9.9 Web Server

Use the Web Server Menu to configure access to the card through the Web interface. Consult your network administrator if needed.

9.9.1 Specify Web Server Settings

To access Web Server settings:

- Click on the **Configure** tab, then **Web** in the left pane.
- Click on **Edit** in the right pane.



- Use the following guide to change any parameters.
- After making changes, click **Save**.

Table 44 Web server settings

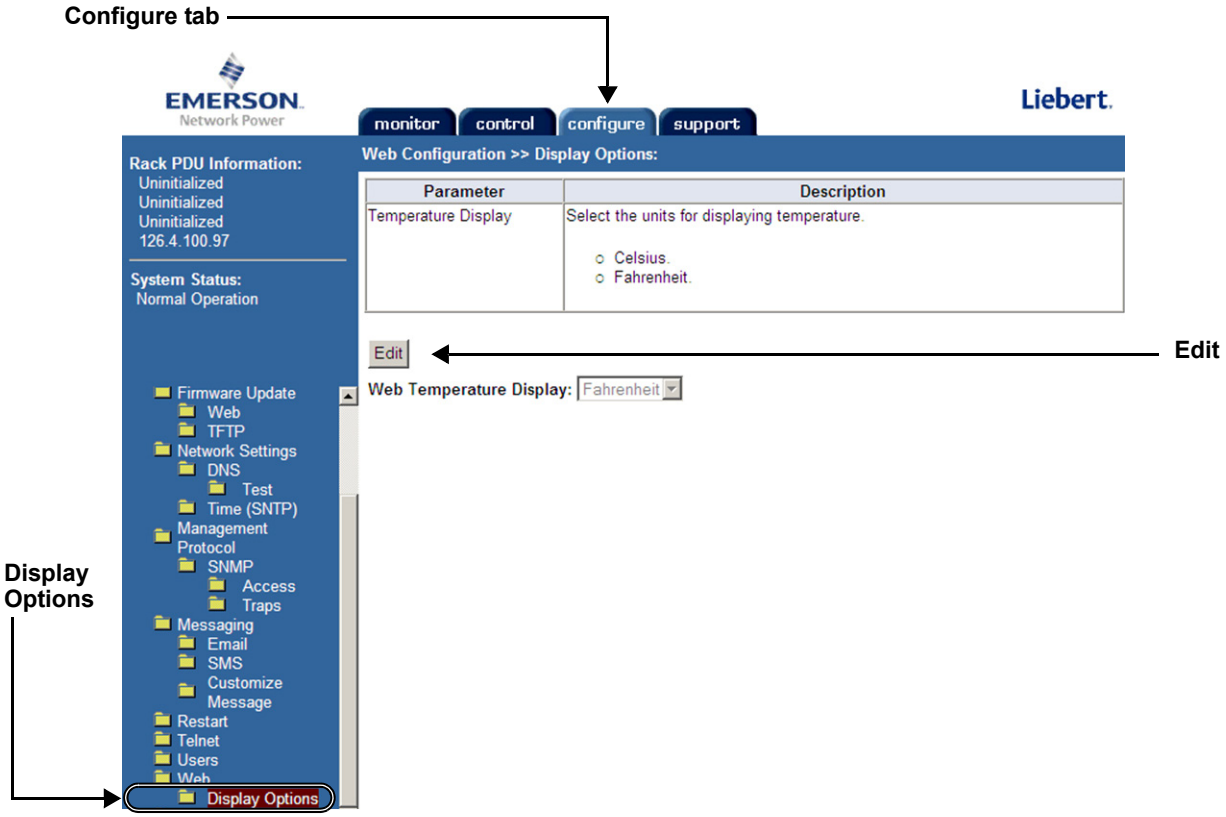
Parameter	Description & Valid Settings
Web Server	Select the operation mode of the Web server. • **Disabled** - Web server is disabled • **HTTP** - Standard Web port, not encrypted • **HTTPS** - Standard secure Web port, all communication is encrypted
HTTP Port	Web Server listening port number for HTTP mode (non-encrypted communications). The default port is 80.
HTTPS Port	Web Server listening port number for HTTPS mode (encrypted communications). The default port is 443. For HTTPS, you must also install a security certificate for Internet Explorer. Refer to the appropriate section for your version of Internet Explorer: • **9.9.3 - Install Security Certificates - Internet Explorer 6 or earlier** • **9.9.4 - Install Security Certificates - Internet Explorer 7 or later**
Password Protect Site	When enabled, the entire site is password-protected. (If disabled, all pages are accessible without a password except configure and control functions.)
Configure/ Control	Enable or disable the use of a Web browser to perform configuration and control operations. **Note:** This feature affects configuration and control operations from the Web interface only. If disabled, these functions may still be available using other system interfaces.
Refresh Interval (seconds)	The interval in seconds (10 to 600 seconds) between automatic updates of dynamic Web pages—parametric data and device status in the right pane. **RECOMMENDATION:** Consider whether frequent updates will slow down the system. If many users will access the device simultaneously, select a larger value to best serve all users. Recommended values range from 20 to 60 seconds.

9.9.2 Specify Web Display Options

Use Display Options to select Celsius or Fahrenheit as the units for displaying temperature, as shown in **7.6.1 - Monitor Tab: Sensors - Status Subtab**.

To access Web Display Options settings:

- Click on the **Configure** tab, then **Display Options** in the left pane.
- Click on **Edit** in the right pane.

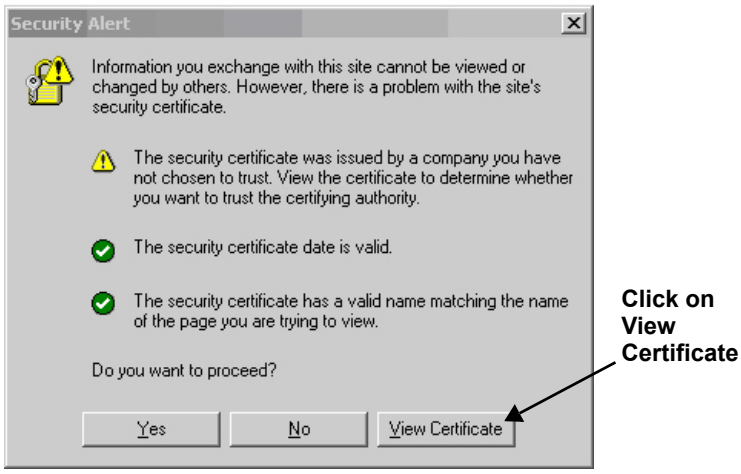


- Select the preferred temperature units from the drop-down menu, **Celsius** or **Fahrenheit**.
- After making changes, click **Save**.

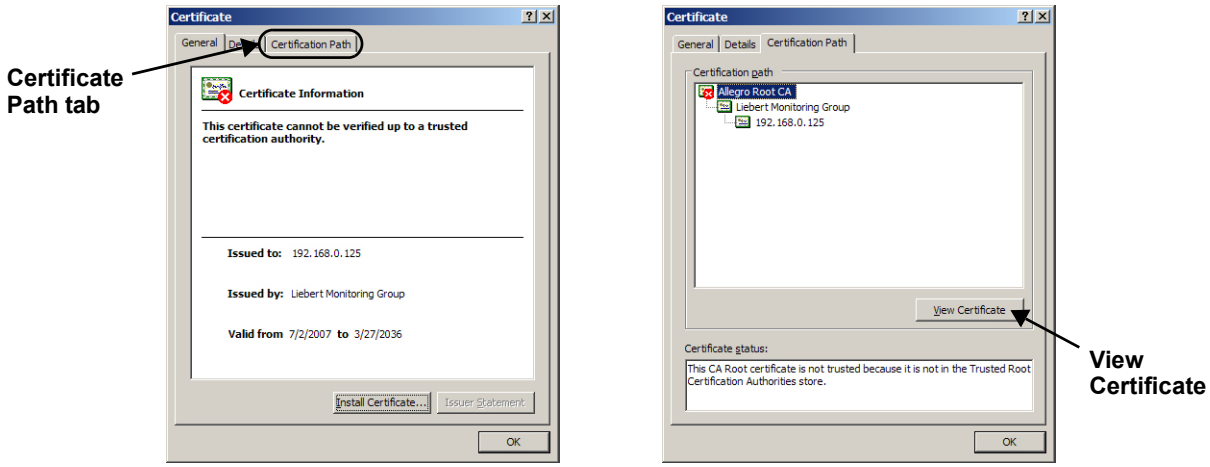
9.9.3 Install Security Certificates - Internet Explorer 6 or earlier

If you use Internet Explorer 6 or an earlier version and select **HTTPS** as the operation mode of the Web server (see **9.9.1 - Specify Web Server Settings**), follow these instructions to install a security certificate.

- Open Internet Explorer and enter **https://** followed by the IP address or hostname of the Liebert RPC card—for example, **https://192.168.0.125**—in the address bar. The following message appears.

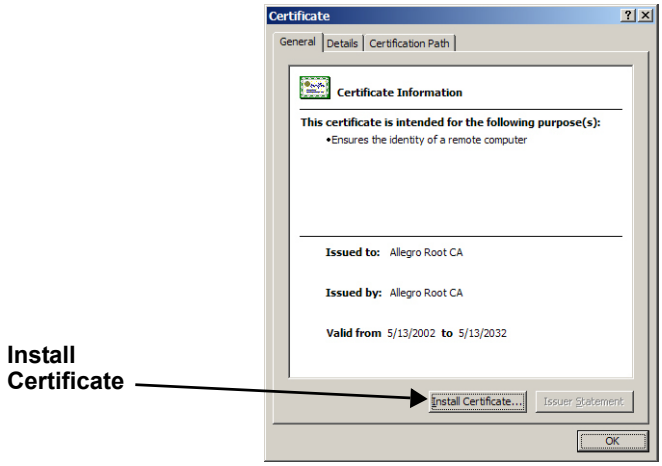

Security Alert
Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.
The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.
The security certificate date is valid.
The security certificate has a valid name matching the name of the page you are trying to view.
Do you want to proceed?
Yes
No
View Certificate
Click on View Certificate

- Click the **View Certificate** button. This opens the Certificate window.



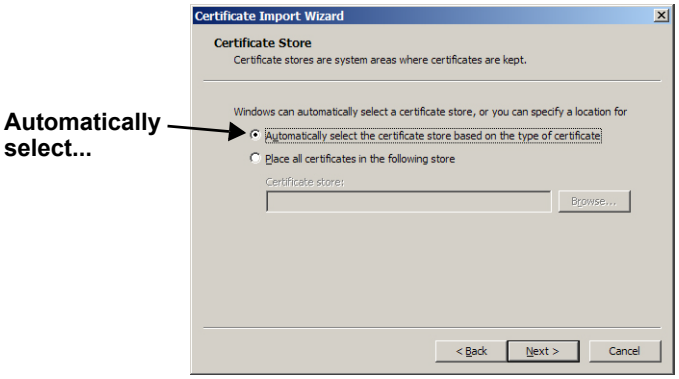
- In the Certificate window, above left, click the **Certificate Path** tab.
- In the Certificate Path tab, above right, click on **Allegro Root CA**, then on **View Certificate**.

- In the Certificate window, click the **Install Certificate** button, as shown below.

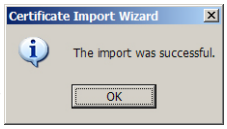


- The Certificate Import Wizard opens. Click **Next**.

Certificate Import Wizard
Welcome to the Certificate Import Wizard
This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.
A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.
To continue, click Next.
< Back
Next >
Cancel


Certificate Import Wizard
Certificate Store
Certificate stores are system areas where certificates are kept.
Windows can automatically select a certificate store, or you can specify a location for
Automatically select the certificate store based on the type of certificate
Place all certificates in the following store
Certificate store:
Browse...
< Back
Next >
Cancel
Automatically select...

- Click on **Automatically select the certificate store based on the type of certificate**, then click **Next**.



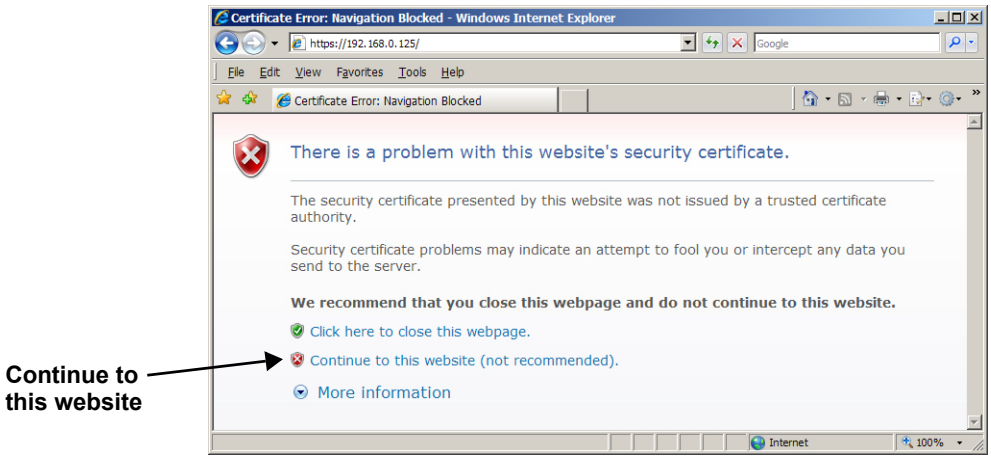
- The final Wizard window appears with a message that the process is complete. Click **Finish**.
- A confirmation box appears with a message that the import was successful. Click **OK**.

9.9.4 Install Security Certificates - Internet Explorer 7 or later

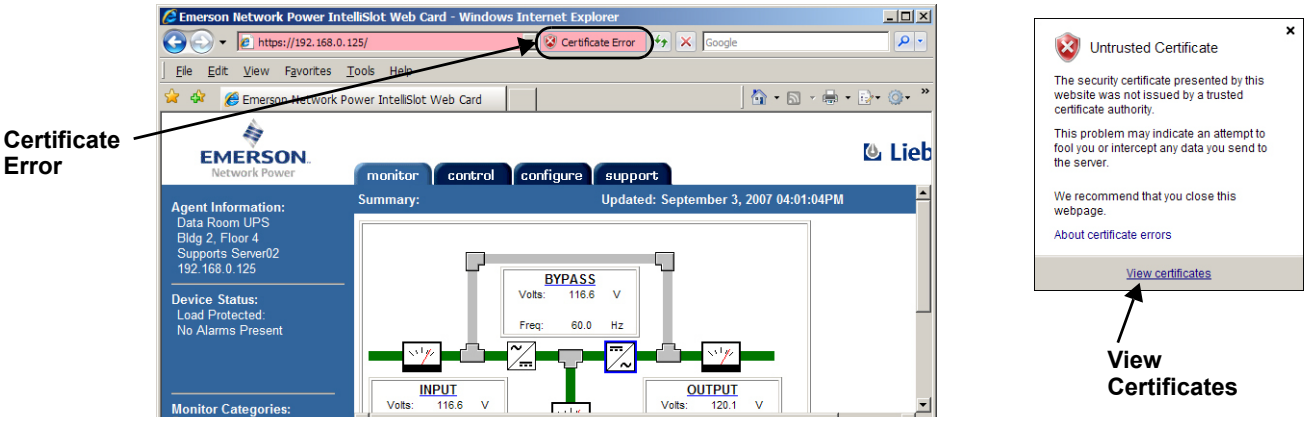
If you use Internet Explorer 7 or later and select **HTTPS** as the operation mode of the Web server (see **9.9.1 - Specify Web Server Settings**), follow these instructions to install a security certificate.

To do this:

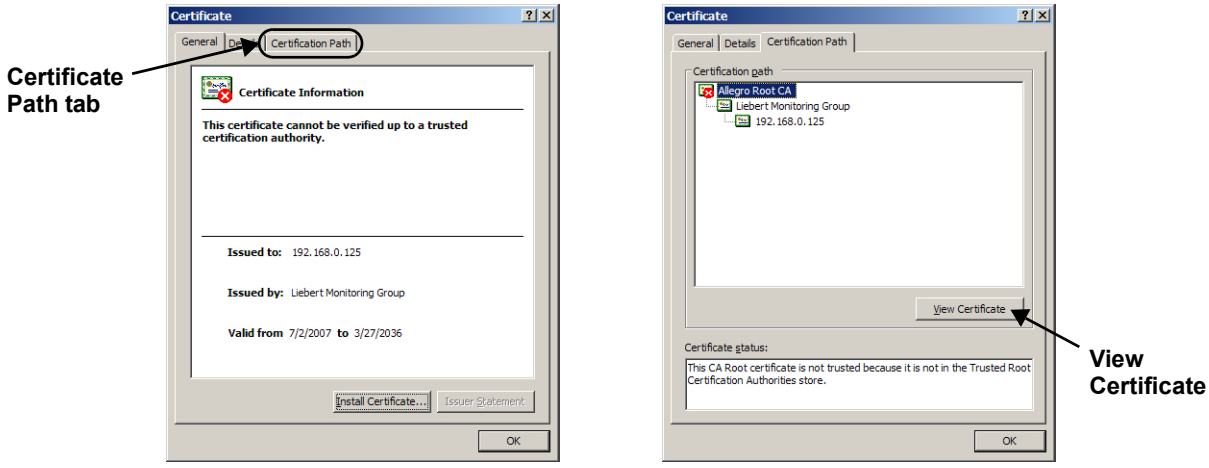
- Open Internet Explorer and enter **https://** followed by the IP address or hostname of the Liebert RPC card—e.g., **https://192.168.0.125**—in the address bar. The following message appears.


Certificate Error: Navigation Blocked - Windows Internet Explorer
There is a problem with this website's security certificate.
The security certificate presented by this website was not issued by a trusted certificate authority.
Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.
We recommend that you close this webpage and do not continue to this website.
Click here to close this webpage.
Continue to this website (not recommended).
More information
Continue to this website

- Click on **Continue to this website (not recommended)** to open a connection to the Liebert RPC card.

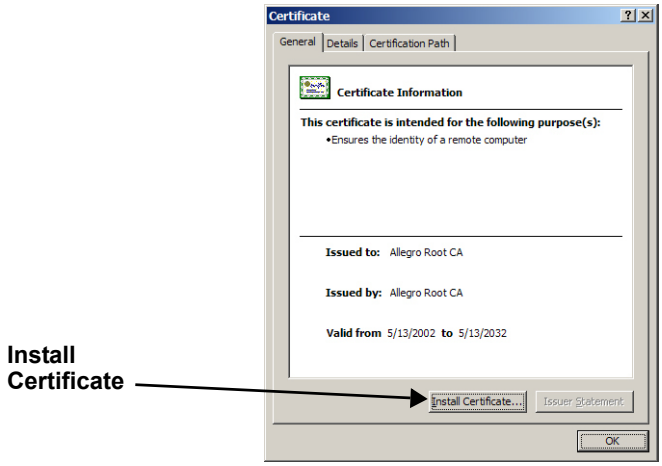


- Click the **Certificate Error** box next to the address bar, shown above left.
- In the window that pops up, shown above right, click the **View Certificates** link. This opens the Certificate window.



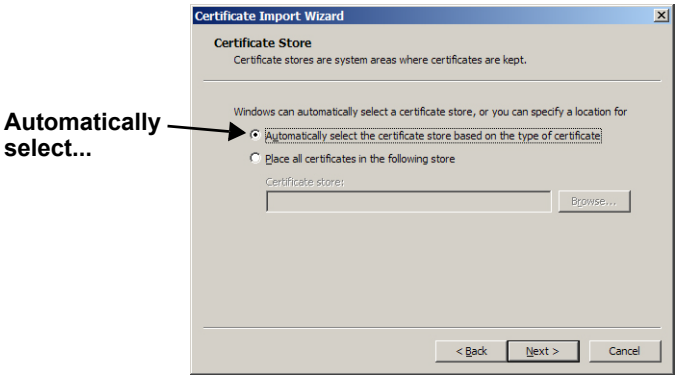
- In the Certificate window, above left, click the **Certificate Path** tab.
- In the Certificate Path tab, above right, click on **Allegro Root CA**, then on **View Certificate**.

- In the Certificate window, click the **Install Certificate** button, as shown below.

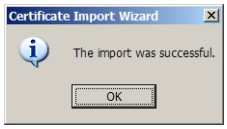


- The Certificate Import Wizard opens. Click **Next**.

Certificate Import Wizard
Welcome to the Certificate Import Wizard
This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.
A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.
To continue, click Next.
< Back
Next >
Cancel


Certificate Import Wizard
Certificate Store
Certificate stores are system areas where certificates are kept.
Windows can automatically select a certificate store, or you can specify a location for
Automatically select the certificate store based on the type of certificate
Place all certificates in the following store
Certificate store:
Browse...
< Back
Next >
Cancel
Automatically select...

- Click on **Automatically select the certificate store based on the type of certificate**, then click **Next**.



- The final Wizard window appears with a message that the process is complete. Click **Finish**.
- A confirmation box appears with a message that the import was successful. Click **OK**.

9.10 Rack PDU Array

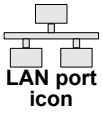
Use this menu to assign a number to each PDU in a Rack PDU Array to specify each unit's position in the array (see **1.3 - Interconnecting Rack PDUs to Create a Rack PDU Array™**). Up to four PDUs may be connected in a Rack PDU Array. Each PDU is factory-configured as PDU #1.

To assemble the Rack PDU Array (see **1.3.1 - Steps for Rack PDU Array Assembly**):

- Connect and configure the first Rack PDU as described in **4.0 - Liebert RPC Installation**. This remains PDU #1 unless changed in the steps described in this section.
- Follow the steps below to assign a new PDU number—2, 3 or 4—to each additional Rack PDU.

To assign a new number to a Rack PDU in a Rack PDU Array:

- Connect a standard Ethernet cable from the Liebert RPC's LAN port to a network, then another Ethernet cable from the Liebert RPC's Expansion/Management port to a computer. See the port icons at right and refer to **4.0 - Liebert RPC Installation**.



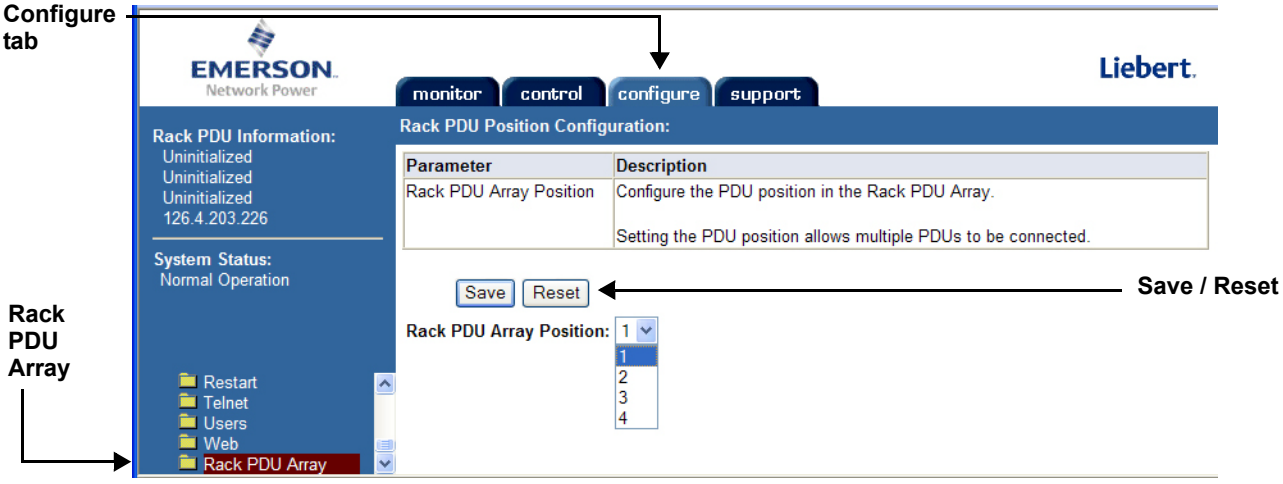
	Your Network Settings
IP Address	PDU #1
LAN Port (Your Network Settings)	User-Defined
Subnet Mask (Your Network Settings)	User-Defined

- Open a Web browser, enter the IP address, then press Enter:
  - If this is Rack PDU #1 (not previously configured as 2, 3 or 4), enter **http://192.168.1.10**.
  - If this is Rack PDU #2, 3 and 4 (previously configured), refer to **Table 45** for addresses.

Table 45 IP addresses in a Rack PDU Array

IP Address	Position in Rack PDU Array			
	Rack PDU #1	Rack PDU #2	Rack PDU #3	Rack PDU #4
Laptop Computer	192.168.1.9	192.168.1.5	192.168.1.1	192.168.1.13
Expansion/Management Port	192.168.1.10	192.168.1.6	192.168.1.2	192.168.1.14
Subnet Mask(PDU Array Settings)	255.255.255.252	255.255.255.252	255.255.255.252	255.255.255.252

- Click on the **Configure** tab, then **Rack PDU Array** in the left pane.
- Click on **Edit** in the right pane.



- Use the following guide to make changes. After making changes, click **Save**.
- Restart the card (see **9.2 - Restarting the Liebert RPC Card**). After restarting, the Rack PDU will have the IP addresses shown in **Table 45**.

Table 46 Web server settings

Parameter	Description & Valid Settings
PDU Position	Select the PDU position—1 through 4—for the PDU that is currently connected.

- When finished, proceed to **Step 3** in **Section 1.3** to make the proper cable connections between the Rack PDUs.

10.0 SUPPORT TAB OPTIONS AND OPERATIONS

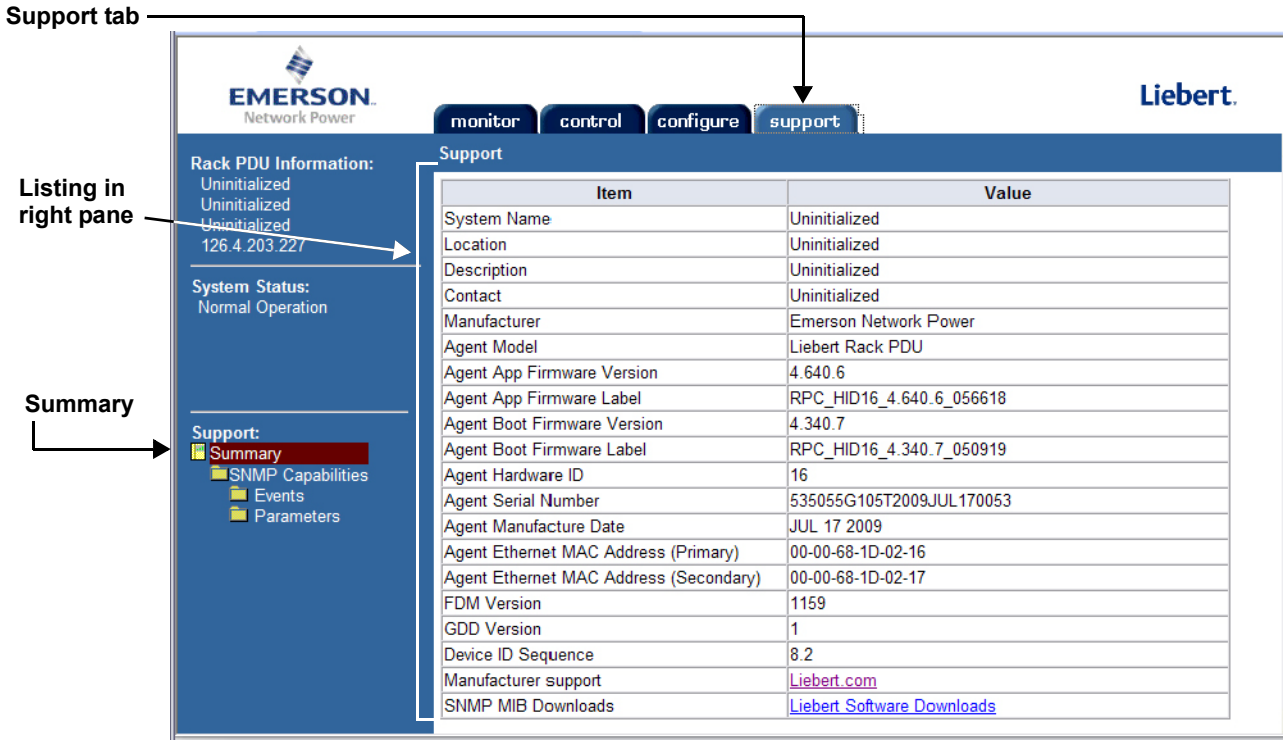
Support data includes identifying information for the Liebert RPC card, as well as events and parameters available for the Liebert equipment.

10.1 Liebert RPC Card Information

The identifying information for the Liebert RPC card includes the MAC address, model, serial number, firmware version and other data.

To view Liebert RPC card information:

- Click on the **Support** tab, then **Summary** in the left pane. The Liebert RPC card information appears in the right pane.



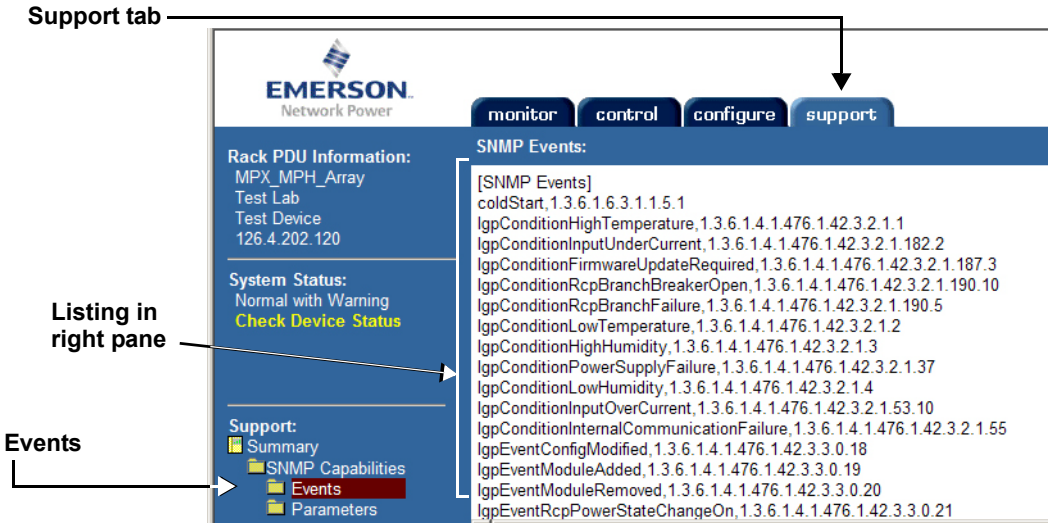
Item	Value
System Name	Uninitialized
Location	Uninitialized
Description	Uninitialized
Contact	Uninitialized
Manufacturer	Emerson Network Power
Agent Model	Liebert Rack PDU
Agent App Firmware Version	4.640.6
Agent App Firmware Label	RPC_HID16_4.640.6_056618
Agent Boot Firmware Version	4.340.7
Agent Boot Firmware Label	RPC_HID16_4.340.7_050919
Agent Hardware ID	16
Agent Serial Number	535055G105T2009JUL170053
Agent Manufacture Date	JUL 17 2009
Agent Ethernet MAC Address (Primary)	00-00-68-1D-02-16
Agent Ethernet MAC Address (Secondary)	00-00-68-1D-02-17
FDM Version	1159
GDD Version	1
Device ID Sequence	8.2
Manufacturer support	Liebert.com
SNMP MIB Downloads	Liebert Software Downloads

10.2 Events and Parameters

You may view a list of all supported events and parameters for the Liebert equipment.

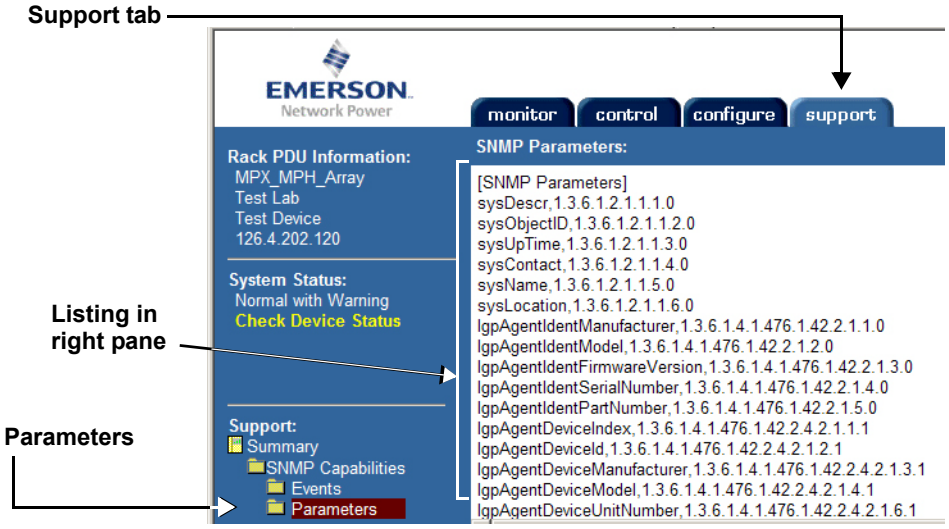
To view supported events:

- Click on the **Support** tab, then **Events** in the left pane. The events are listed in the right pane.



To view supported parameters:

- Click on the **Support** tab, then **Parameters** in the left pane. The parameters are listed in the right pane.



11.0 RPC BDM™ (OPTIONAL)

The RPC BDM is a small monitoring device that displays parametric data from Liebert MPX™ or Liebert MPH™ units through a connection to a Liebert RPC. The unit provides another way to browse PDU data using the PDU Explorer and Device Explorer, as in the Web interface.

NOTE

The RPC BDM is a read-only display that may be used to view data but not to control or configure devices.

*To perform control and configuration functions, use the Web or SNMP interface (see **8.0 - Control Tab Options and Operations** and **9.0 - Configure Tab Options and Operations**).*

The display unit, which can be mounted on a wall or in the rack, permits users to:

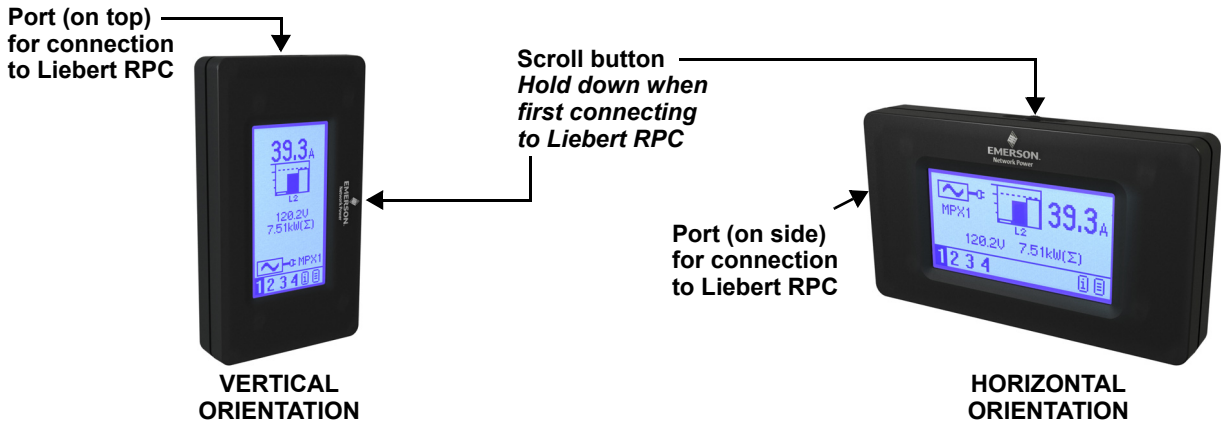
- View monitoring data via the PDU Explorer and Device Explorer
- Identify the load of PDU input lines, branch circuit breakers and receptacles (varies by model)
- Identify the load of PDU devices using the user-assigned label
- View Liebert SN™ sensor readings for areas monitored by connected sensors
- Identify the IP address and MAC address of the PDU
- Browse user-assigned receptacle labels to view parametric information
- View active events list
- Balance PDU line loads

11.1 Orientation of the RPC BDM

The RPC BDM may be rotated for vertical or horizontal display, as shown in **Figure 11**.

To set the orientation, hold down the scroll button when first connecting the RPC BDM to the Liebert RPC.

Figure 11 Vertical or horizontal orientation



11.2 RPC BDM™ Installation

Installing the RPC BDM requires two steps described in the following sections:

- **Section 11.2.1** - Initialize the Liebert RPC with an IP address.
- **Section 11.2.2** - Connect the RPC BDM to the Liebert RPC (in a Liebert MPX™ or Liebert MPH™).

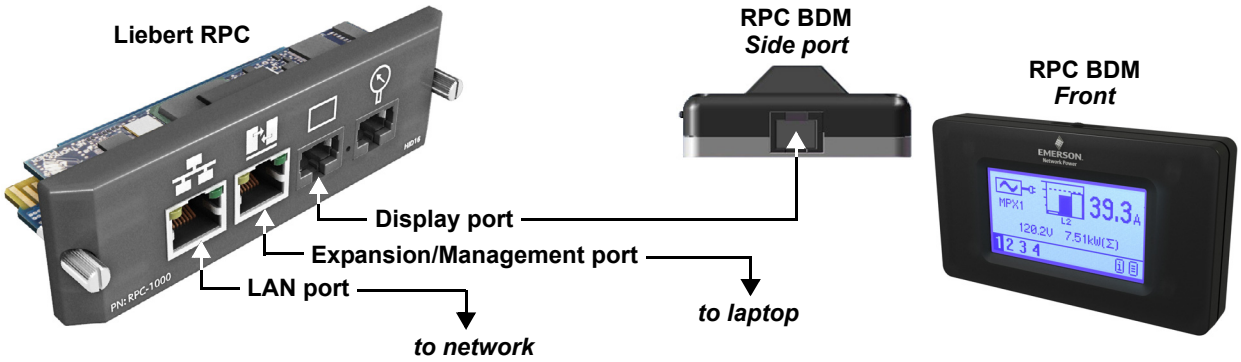
The RPC BDM comes with a factory-supplied Ethernet cable for connection to the Liebert RPC. If additional or longer cables are needed, use standard Ethernet cables.

11.2.1 Set the IP Address for the Liebert RPC

The Liebert RPC and the RPC BDM may be used on a network or as stand-alone units. Either mode requires initializing the Liebert RPC with an IP address before the RPC BDM can display data.

Follow the appropriate steps to initialize the Liebert RPC in a networked or stand-alone environment. Refer to **Figure 12** for location of ports on the Liebert RPC.

Figure 12 Liebert RPC ports for use with RPC BDM



To Initialize Liebert RPC in a Network Environment:

1. Use an Ethernet cable to connect the LAN port to the network.
2. Obtain an IP address for the Liebert RPC:
   a. If DHCP is used, the LAN port will receive an IP address automatically.
   b. If DHCP is not used:
      - Use an Ethernet cable to connect the Expansion/Management port to a laptop.
      - Assign a static IP address to the LAN port, then click restart to initialize the Liebert RPC, as described in **Steps 5-10** in **4.2 - Configure the Card**.

To Initialize Liebert RPC in Stand-Alone Mode (Non-Networked):

1. Use an Ethernet cable to connect the Expansion/Management port to a laptop.
2. Assign a static IP address to the LAN port, then click restart to initialize the Liebert RPC, as described in **Steps 5-10** in **4.2 - Configure the Card**.

After the Liebert RPC is initialized, the IP address may be viewed on the RPC BDM. Proceed to **11.2.2 - Connect the RPC BDM** to connect the Liebert RPC to the RPC BDM.

11.2.2 Connect the RPC BDM

To connect the RPC BDM to a Liebert RPC:

- Connect one end of the factory-supplied Ethernet cable into the RPC BDM port.
- Connect the other end of the cable into the display port of the Liebert RPC.

CAUTION

The Ethernet cable **MUST** be plugged into the Liebert RPC display port. Using any other port on the Liebert RPC could cause serious damage.

Once the PDU is turned On with these connections made, the RPC BDM is fully operational.

11.3 Placement of the RPC BDM™

The RPC BDM may be mounted in various locations inside a rack for easy access and viewing.

The unit may be rotated for vertical or horizontal display, as described in **11.1 - Orientation of the RPC BDM**.

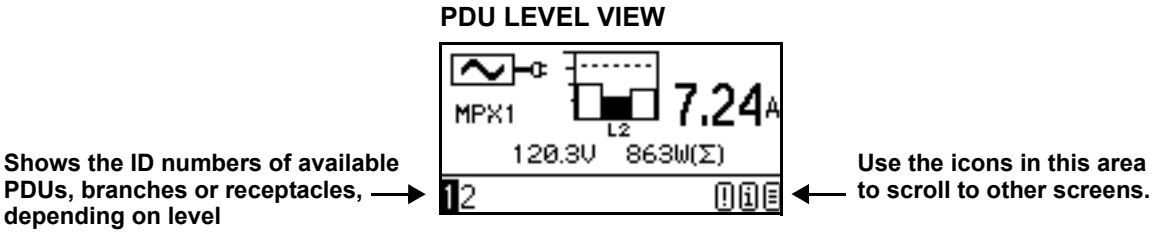
11.4 Navigation Tips

The RPC BDM has a scroll button for navigation (see **Figure 11**).

To navigate and select items:

- Use the scroll button to move the cursor to highlight an item on the screen.
- Depress the scroll button to select the highlighted item.

Figure 13 RPC BDM navigation icons


PDU LEVEL VIEW
MPX1
7.24A
L2
120.3V 863W(Σ)
12
Shows the ID numbers of available PDUs, branches or receptacles, depending on level
Use the icons in this area to scroll to other screens.

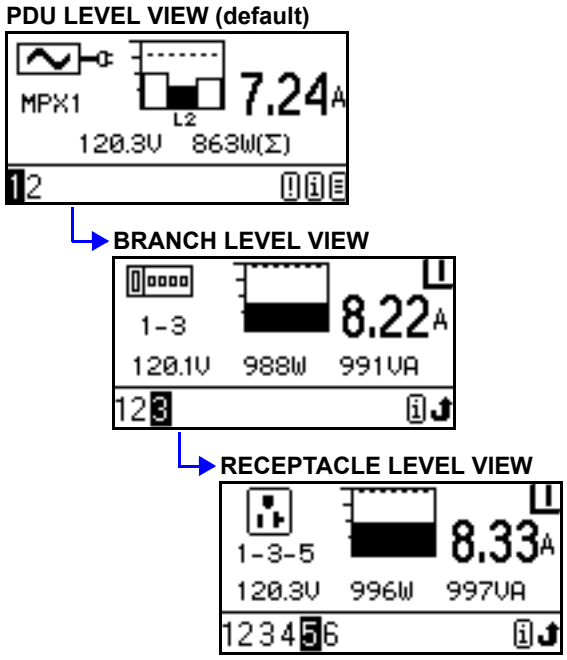
11.5 RPC BDM Operation

11.5.1 PDU, Branch and Receptacle Views Overview

The PDU Explorer hierarchy provides three levels for viewing Rack PDU data: PDU, branch and receptacle. The PDU level is the default view.

Figure 14 at right shows examples of the three views. For details on each view, see **11.6 - RPC BDM: PDU Explorer**.

Figure 14 RPC BDM views



- An icon in the top left corner identifies the component type—PDU, branch or receptacle.

Level	Icon	Label in example shows:
PDU level	MPX1	A Rack PDU with the user-assigned label *MPX1*
Branch level	1-3	Branch #3 on Rack PDU #1
Receptacle level	1-3-5	Receptacle #5 on Branch #3 of Rack PDU #1

- The highlighted ID number in the bottom left corner indicates which component is currently displayed—e.g., PDU #1, Branch #3, Receptacle #5.
- The component data includes a graph, amperage and status (V, W; VA for branch/receptacle).
- Navigation buttons appear in the bottom right corner of each screen.
- When any events are detected, the display changes to the PDU view and an Active Events icon appears at bottom right. See **11.5.3 - Viewing Active Events** for details.

11.5.2 Types of Data Available at PDU, Branch and Receptacle Levels

The following table shows the types of data available at each level.

Table 47 Monitoring data available on the RPC BDM via PDU Explorer

Data available	PDU	Branch	Receptacle
Graph of power utilization	✔ (each phase)	✔	✔
Amperage of selected module	✔ (each phase)	✔	✔
Voltage of selected module	✔	✔	✔
Wattage of selected module	✔	✔	✔
VA of selected module	—	✔	✔
State: On/Off	—	✔	✔

NOTE: Branch and Receptacle data may vary depending on the MPX BRM model and Liebert MPH™ capabilities.

11.5.3 Viewing Active Events

When an event is detected, the display switches to the PDU view with an Active Events icon in the bottom right corner of the screen, shown below left.

- Scroll to the Active Events icon (below left), then press the scroll button to select it.
- The Device Explorer view displays a list of events with icons to indicate severity (below right).
- To view details for any listed event, scroll to that event, then press the scroll button.

11.6 RPC BDM: PDU Explorer

The PDU Explorer uses a hierarchy to display data from connected equipment, starting with the PDU view at the highest level (default opening view), allowing users to browse down one level to view branches, then another to the receptacle view.

11.6.1 View PDU Data

To view data for a PDU:

- Select a PDU number in the bottom left corner. The selected number will be highlighted.
- The screen displays information for the selected PDU. The example below shows data for PDU #1, one of two PDUs that are communicating with the RPC BDM unit.
- The PDU view displays information collected at the PDU input point for each of the three input phases: L1, L2 and L3. Up to three phases may be used.
- See **Table 48** for explanations of components that appear on the screen.

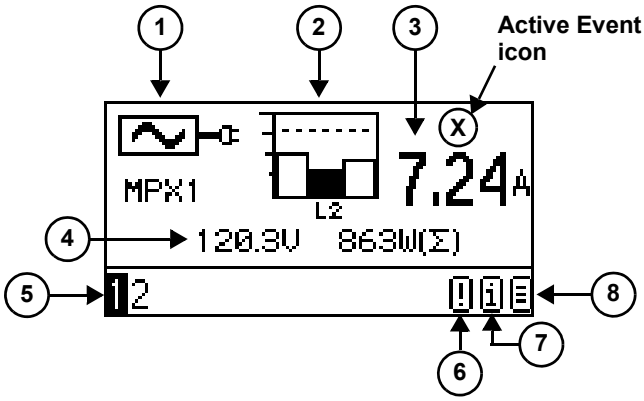
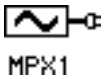
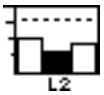
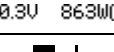
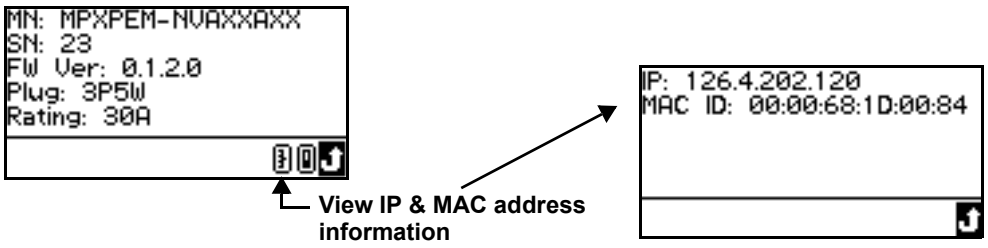


Table 48 PDU view components

#	Item	Item Description	Purpose
1		Component Identification	Displays an icon to indicate the type of component selected—PDU in this example—as well as the user-assigned name (e.g., MPX1).
2		Power Utilization Graph	Graphically displays the approximate power utilization of each input phase. The display automatically scrolls from phase to phase. The bar for the selected phase appears dark, with the input phase number displayed below the bar.
3		Amperage	Displays the amperage of the selected phase.
4		Voltage, Total Power	Displays voltage of each line and total power for the selected PDU.
5		Rack PDU ID Number	Select a given PDU to view its information.
6		Active Events	Go to a screen to view active events for the selected component. This button appears only when active events are detected.
7		Information*	Select to view ratings and serial number information for the Rack PDU and access screens providing temperature and IP address information. See example of PDU level information screen* below.
8		Device Explorer	Select to view a list of user-assigned labels of receptacles. See **11.7 - RPC BDM: Device Explorer** for more detail.

*** Example of PDU level information screen**



11.6.2 View Branch Data

The availability of branch information depends on the capabilities of the PDU.

To view data for a branch module:

- Select a branch number in the bottom left corner. The selected number will be highlighted.
- The screen displays information for the selected branch module. The example below shows data for Branch #3, one of three branches on PDU #1 that are communicating with the RPC BDM unit.
- See **Table 49** for explanations of components that appear on the screen.

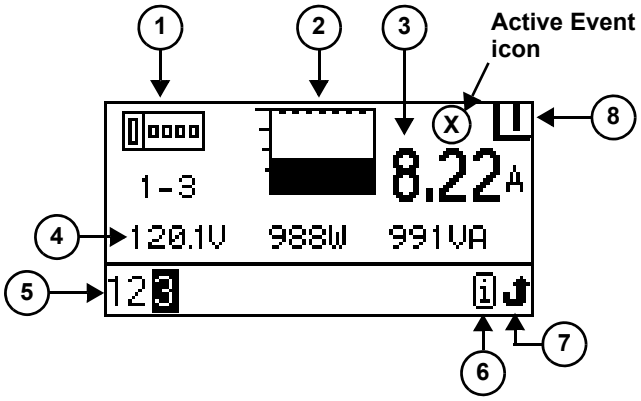
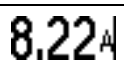
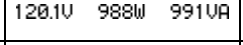
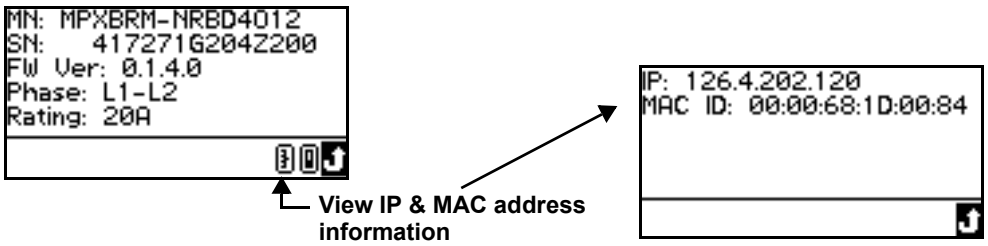


Table 49 Branch view components

#	Item	Item Description	Purpose
1		Component Identification	Displays an icon to indicate the type of component selected—branch in this example—as well as the branch ID, which is in the format: *PDU# - Branch#* (See **5.2 - Rack PDU Component ID** for details.)
2		Power Utilization Graph	Graphically displays the approximate power utilization of the selected components.
3		Amperage	Displays the amperage of the selected module.
4		Voltage, Power, Apparent Power	Displays voltage, power and apparent power for the selected branch.
5		Branch ID Number	Select a given branch to view its information.
6		Information*	Select to view information about the selected branch. See example of branch level information screen* below.
7		Up One Level	Move up one level—in this example, from branch to PDU view.
8		On/Off status	Displays an icon to indicate whether the module is On or Off.

*** Example of branch level information screen**



11.6.3 View Receptacle Data

The availability of receptacle information depends on the capabilities of the PDU.

To view data for a receptacle:

- Select a receptacle number in the bottom left corner. The selected number will be highlighted.
- The screen displays information for the selected receptacle. The example below shows data for Receptacle #5, one of six receptacles on Branch #3 of PDU #1 that are communicating with the RPC BDM unit.
- See **Table 50** for explanations of components that appear on the screen.
- A list of receptacles may be viewed in the Device Explorer (see **11.7 - RPC BDM: Device Explorer** for details).

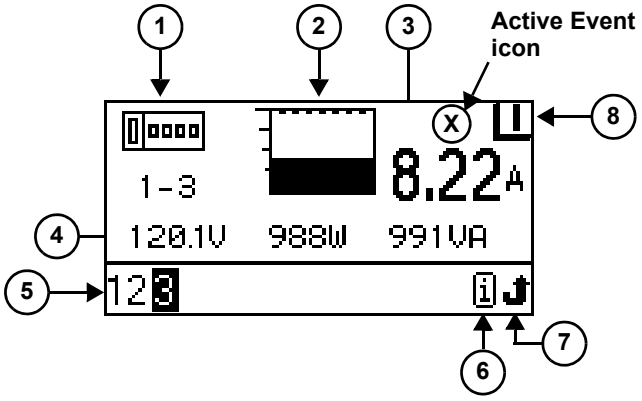
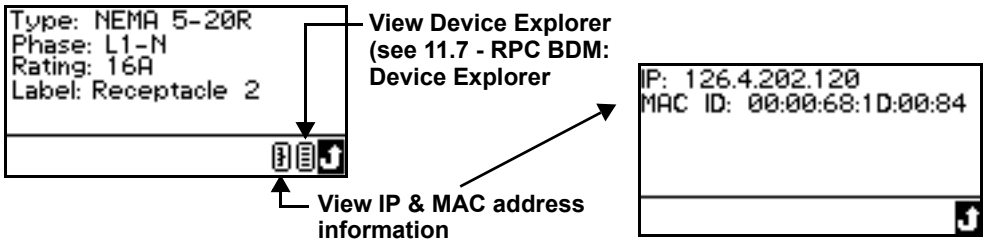


Table 50 Receptacle view components

#	Item	Item Description	Purpose
1	1-3-5	Component Identification	Displays an icon to indicate the type of component selected—receptacle in this example—as well as the receptacle ID, which is in the format: *PDU# - Branch# - Receptacle#* (See **5.2 - Rack PDU Component ID** for details.)
2		Power Utilization Graph	Graphically displays the approximate power utilization of the selected components.
3	8.33A	Amperage	Displays the amperage of the selected module.
4	120.3V 996W 997VA	Voltage, Power, Apparent Power	Displays voltage, power and apparent power for the selected receptacle.
5	123456	Receptacle ID Number	Select a given receptacle to view its information.
6		Information*	Select to view information about the selected receptacle. See example of receptacle level information screen* below.
7		Up One Level	Move up one level—in this example, from receptacle to branch view.
8		On/Off status	Displays an icon to indicate whether the module is On or Off.

*** Example of receptacle level information screen**

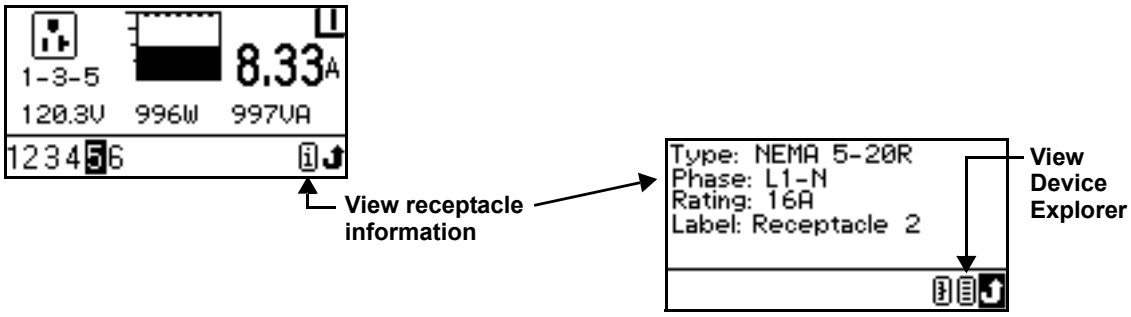


11.7 RPC BDM: Device Explorer

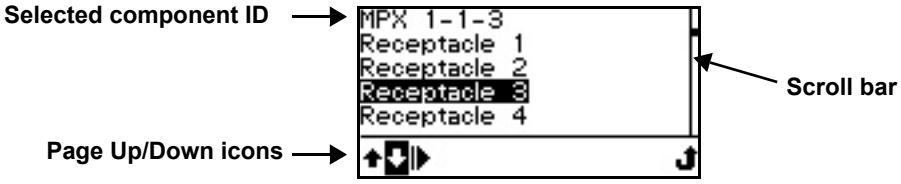
The Device Explorer displays a list of all receptacles on a single Rack PDU.

To access the Device Explorer:

- Select the Information icon in the Receptacle view, shown below left.
- Select the Device Explorer icon in the Receptacle Information screen, below right.



- Use the scroll button to highlight a receptacle in the list. If a scroll bar appears on the right, use the Page Up and Page Down icons to display the rest of the list.
- Press the scroll button to select the highlighted receptacle.
- The screen displays the PDU Explorer view for the selected receptacle (see **11.6.3 - View Receptacle Data** for details).



12.0 LIEBERT SN™ SENSOR INSTALLATION (OPTIONAL)

The Liebert RPC is designed to monitor Liebert SN integrated and modular sensors.

- **Integrated sensors** are attached to a single cable. These Liebert SN sensors are available in several varieties, including single or multiple temperature sensors.
- **Modular sensors** are separate probes shipped with a cable for connection to the Liebert RPC.
- Liebert SN sensors may be connected in a string, including a combination of modular and integrated sensors.
- The maximum string length is 65.6 ft. (20m).
- The maximum number of probes that may be connected to a Liebert MPH™ or Liebert MPX™ is 10. Refer also to the quick-start guides for integrated (SL-20840) and modular (SL-52405) sensors. See the sensor quick-start guides for details on the number of probes in each type of sensor.

Liebert SN sensors may be placed in any area—for example, in a Knurr® rack—to monitor conditions such as temperature and humidity levels or the state of a contact.

12.1 Introduction

Installing a sensor requires mounting the sensor, connecting it to Liebert monitoring equipment, confirming the change and configuring sensor parameters:

- **12.2 - Record the Sensor Address** - Write the addresses of all sensors on labels and in a log
- **12.3 - Mount the Sensor** - Mount the sensor securely in the appropriate location
- **12.4 - Connect the Sensor** - Attach the cable to the sensor port on the Liebert product
- **12.5 - Confirm the Module Change** - Acknowledge the sensor connection via the Web interface
- **12.6 - Configure the Sensor** - Configure parameters such as thresholds to trigger alarms

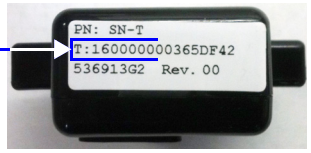
12.2 Record the Sensor Address

During configuration, the Web interface will display the addresses of all connected sensors. You will need to be able to identify which address belongs to each sensor.

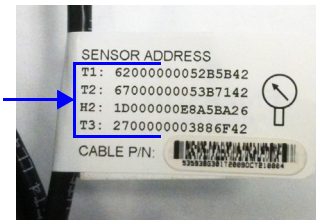
Be sure to make a note of each sensor's address before mounting and connecting sensors.

The sensor address can be found on the sensor itself (modular sensors) or the RJ45 end of the sensor cable (integrated sensors), shown in the examples at right.

MODULAR SENSOR
Address for one sensor:
1 temperature sensor (T)



INTEGRATED SENSOR
Addresses for four sensors:
3 temperature (T1, T2, T3)
1 humidity (H2)



12.3 Mount the Sensor

The sensor may be mounted in a Knurr rack or another type of rack.

For temperature and humidity sensors, be sure to choose a place with unobstructed airflow—for example, on the rack door. Check to make sure that the sensor does not cover any vents that might impede airflow.

Refer to the sensor quick-start guide for detailed instructions for each of the following four options:

- Mount on a Knurr rack frame or 19-inch rail
- Mount the sensor on the rack door
- Mount the sensor on a flat surface
- Mount the sensor on the rack rails

12.4 Connect the Sensor

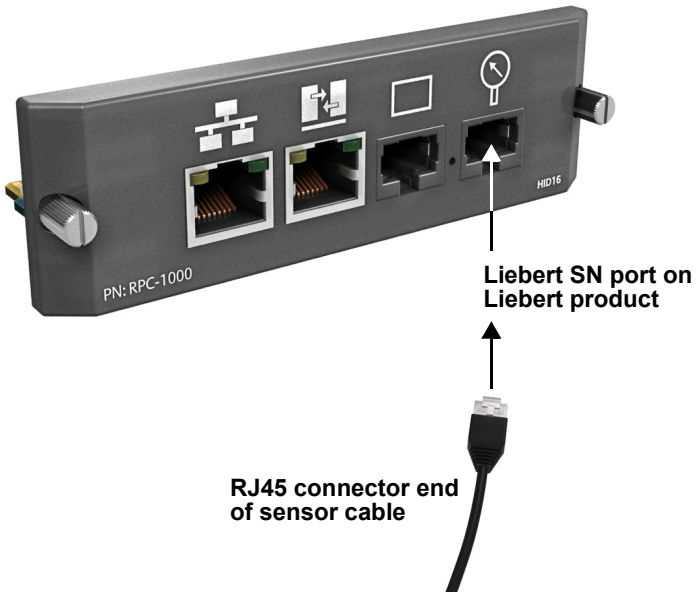
Each sensor is shipped with a cable to connect to the Liebert SN™ port on your Liebert product. The Liebert RPC (Rack PDU Card) must be installed before the sensor may be connected (see **4.0 - Liebert RPC Installation** for more information).

To connect the sensor:

- After securely mounting the sensor (see **12.3 - Mount the Sensor**), determine the location of the Liebert SN port, identified by the icon shown below.

Icon	Description	Purpose
	Liebert SN Port	Use this port **ONLY** to plug in optional sensor accessories.

- Insert the RJ45 connector end of the sensor cable into the Liebert SN port on the Liebert product, as in the example shown below.



NOTE

When adding sensors to a string, disconnect the entire string from the sensor port and wait one minute, then reconnect the string to the port.

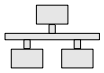
When the string is reconnected to the sensor port, all information will be retained for sensors existing in a string prior to adding the new sensor.

12.5 Confirm the Module Change

After connecting the sensor, you must acknowledge the change via the Web interface before the sensor may be monitored. You will need the sensor address recorded in **Section 12.2**. Refer also to **8.5 - Controlling a Sensor - Settings Tab** for more details.

First connect a laptop to the LAN port of the Liebert RPC or to the Web interface across an existing network connection:

- Connect a Local Area Network Ethernet cable (not included) to the LAN port, identified by the icon shown below.

Icon	Description	Purpose
	LAN Port	Use this port **ONLY** for: • Plug in the Local Area Network (LAN) via an Ethernet cable (not included)—*DESCRIBED IN THIS SECTION.* • Creating a Rack PDU Array by interconnecting additional Rack PDUs—described in **Section 1.3**).

- Insert the other end of the Ethernet cable into a laptop. (If needed, refer to **4.1 - Install the Card** for details on connecting to the Rack PDU.)

Next, confirm the change as described in **8.5 - Controlling a Sensor - Settings Tab**:

- Click on the **Control** tab at the top of the window.
- Click on **Module Changes** in the left pane to display a list of PDU components that have been added or removed but not yet acknowledged.
- The viewing area in the right pane displays the following data.

Element	Description
Module Serial Number	Displays the serial number for each listed module. This is the sensor address recorded in **Section 12.2**.
Module Type	Indicates the kind of component—e.g., auxiliary sensor string.
Added	**Added** indicates a module has been connected to the PDU.
Removed	**Removed** indicates a module has been disconnected from the PDU.

- Module changes must be acknowledged before remote management is enabled or disabled. Click the **Acknowledge** button for the changes to take effect.

CAUTION

After a module is disconnected from the PDU and the change is acknowledged in the Module Changes option of the Control tab, **the module's information is removed from the system**.

If that same module is later reinstalled, it must be reconfigured as a new module. First, acknowledge the addition of the reconnected module in the Module Changes option of the Control tab, then make other configuration changes as needed.

12.6 Configure the Sensor

After connecting the sensor and acknowledging the change via the Web interface:

- Make other changes as needed—for example, assign a label for the sensor and configure temperature or humidity thresholds to trigger warnings and alarms (see **8.5 - Controlling a Sensor - Settings Tab**).
- Refer to the following sections in this manual for additional details about using the sensor with the Liebert RPC.
  - **7.6 - Monitor Tab: Sensors - Overview**
  - **8.5 - Controlling a Sensor - Settings Tab**

13.0 FIRMWARE UPGRADE

The Liebert RPC may be updated to take advantage of the latest release of the firmware with enhanced features, compatibility with new units or service patches. Upgraded firmware may be downloaded with a browser, such as Internet Explorer. Emerson maintains firmware upgrades on its Web site, **www.liebert.com/downloads**.

NOTE
Emerson recommends that users read all the instructions prior to attempting a firmware upgrade.

13.1 Only Connected Components Will be Upgraded

Upgrading the Liebert RPC's firmware takes about 20 minutes. During the upgrade, the Liebert RPC upgrades all connected components. If a component is not connected, it will not be upgraded and must go through the 20-minute upgrade later, when it is attached.

Before beginning to upgrade the Liebert RPC's firmware, connect all components to the Liebert MPX™ or Liebert MPH™. This includes all MPX PEMs, MPX BRMs, MPX BDMs and MPH BDMs (see **Table 4**).

13.2 Overview

The firmware upgrade involves these steps:

Table 51 Overview of the upgrade process

Step	For details, see:
1. Connect to the Liebert RPC	**13.4 - Connect to the Card and Open the Web Interface**
2. Prepare for the upgrade	
• Make sure you have everything needed to perform the upgrade	**13.5.1 - Requirements to Update the Liebert RPC Firmware**
• Check the firmware version currently installed	**13.5.2 - Determine the Firmware Version**
• Download the upgrade file from the Liebert Web site	**13.5.3 - Download the Firmware Upgrade File to the Computer**
• Decide which method to use for the upgrade	**13.5.4 - Choose a Method to Install the Firmware Upgrade**
3. Follow the step-by-step instructions to upgrade the firmware with the chosen method:	
• Web (HTTP) Method	**13.6 - Updating the Firmware - Web (HTTP) Method**
• TFTP Method	**13.7 - Updating the Firmware - TFTP Method**

13.3 Estimated Time to Download the Firmware Upgrade File

The amount of time required to download the firmware upgrade file depends on the upgrade method used. Refer to **Table 52** for estimated times for each method.

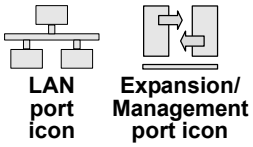
Table 52 Estimated time for downloads

Upgrade Method	Expected Speed
HTTP Method (.epm file)	6-7 minutes (subject to network traffic)
TFTP Method (.epm file)	5-6 minutes (subject to network traffic)

13.4 Connect to the Card and Open the Web Interface

To connect to the Liebert RPC and open the Web interface:

1. Connect a standard Ethernet cable from the LAN port on the Liebert RPC to a network, then another Ethernet cable from the Expansion/Management port or of the Rack PDU to a computer. See the port icons at right and refer to **4.0 - Liebert RPC Installation**.

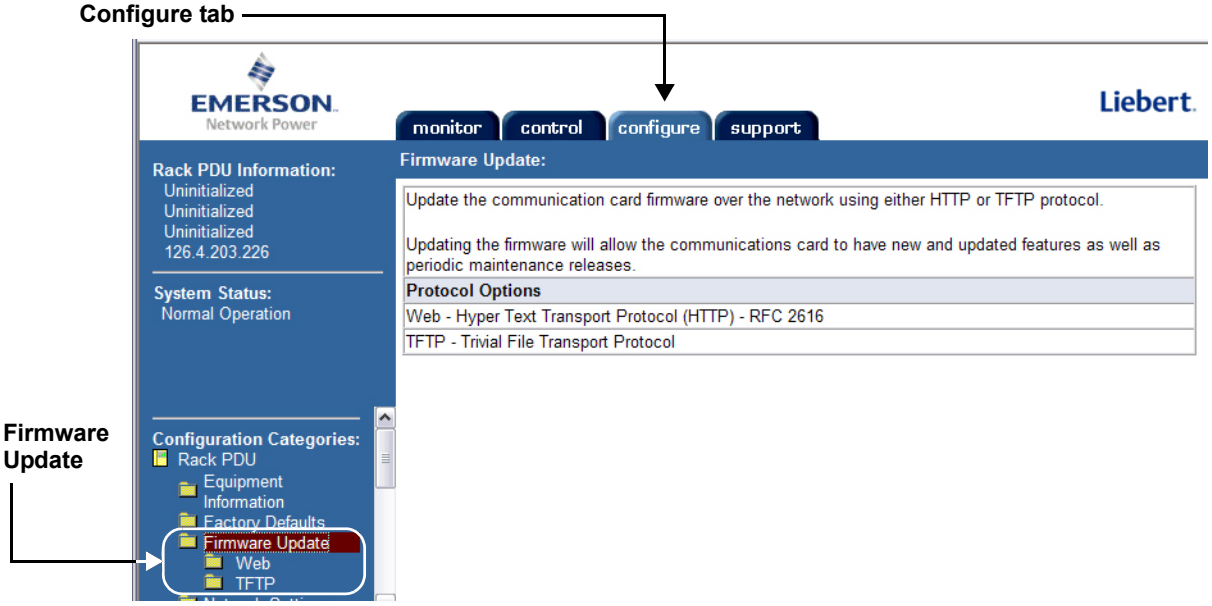


2. Open a Web browser, enter the IP address in the format **http://*IP address***, then press Enter:
   - If this is a single Rack PDU or Rack PDU #1 in a Rack PDU Array, enter **http://192.168.1.10**.
   - If this is Rack PDU #2, 3 or 4 in a Rack PDU Array, refer to **Table 53** for addresses.

Table 53 IP addresses in a Rack PDU Array

IP Address	Position in Rack PDU Array			
	Rack PDU #1	Rack PDU #2	Rack PDU #3	Rack PDU #4
Expansion/Management Port	192.168.1.10	192.168.1.6	192.168.1.2	192.168.1.14
LAN Port	User-configured	192.168.1.9	192.168.1.5	192.168.1.1
Subnet Mask	255.255.255.252	255.255.255.252	255.255.255.252	255.255.255.252

3. Click on the **Configure** tab at the top of the window, then **Firmware Update** in the left pane.
4. The right pane displays a description of the process and the protocol options.
   - Web (HTTP) - see **13.6 - Updating the Firmware - Web (HTTP) Method**
   - TFTP - see **13.7 - Updating the Firmware - TFTP Method**



5. After a Firmware Update option is clicked in the left pane, the Connect To box, shown at right, opens with a prompt to enter the Administrator user name and password (both case-sensitive):
   a. **User Name** (default is *Liebert*)
   b. **Password** (default is *Liebert*)

Connect to mphwebdemo.liebert.com
The server mphwebdemo.liebert.com at Administrator Password Required requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
Liebert
Password:
Remember my password
OK
Cancel
Connect To

13.5 Preparing to Update Liebert IntelliSlot® Firmware

13.5.1 Requirements to Update the Liebert RPC Firmware

Make sure you have the following before starting the update:

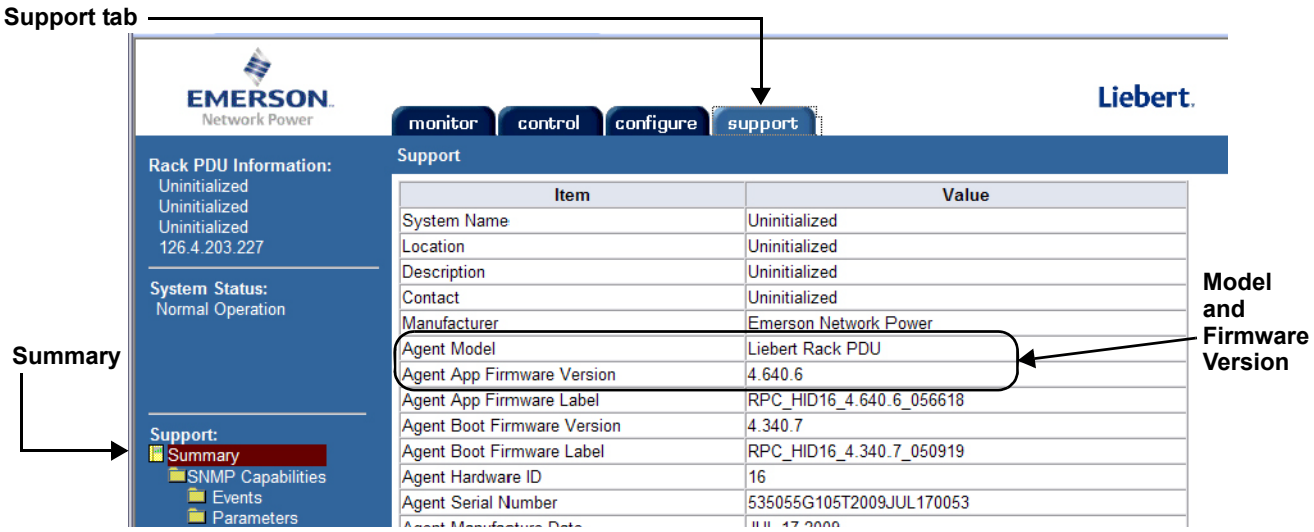
- The firmware upgrade file downloaded from the Liebert Web site (see **13.5.3 - Download the Firmware Upgrade File to the Computer**)
- A computer running Internet Explorer 5.5 or newer and an Internet connection
- A Liebert RPC with an Ethernet connection from the Expansion/Management port to a computer

13.5.2 Determine the Firmware Version

Attempting to upgrade the Liebert RPC with the wrong firmware will fail and may damage the card.

To determine the firmware version and other card information in your Liebert RPC:

1. Open a connection to the Liebert RPC (if needed, see instructions in **13.4 - Connect to the Card and Open the Web Interface**).
2. Click on the **Support** tab, then **Summary** in the left pane. The Liebert RPC card model and firmware version appear in the right pane.



13.5.3 Download the Firmware Upgrade File to the Computer

NOTE

Turn off the power management on your PC or laptop before beginning the update to ensure that communication will not be disrupted during the process.

To download the upgrade file:

1. Open a Web browser, such as Internet Explorer (5.5 or newer).
2. Navigate to the Liebert Web site, **www.liebert.com/downloads**.
3. Choose the firmware upgrade from the selections on the Web page (see **13.5.2 - Determine the Firmware Version**).
4. Click on the link to download the file.
5. Save the file to your computer's hard drive.
   Be sure to make a note of the location where the file is saved.

13.5.4 Choose a Method to Install the Firmware Upgrade

To install the firmware upgrade, choose one of these methods and refer to the step-by-step directions:

- Web (HTTP) - see **13.6 - Updating the Firmware - Web (HTTP) Method**
- TFTP - see **13.7 - Updating the Firmware - TFTP Method**

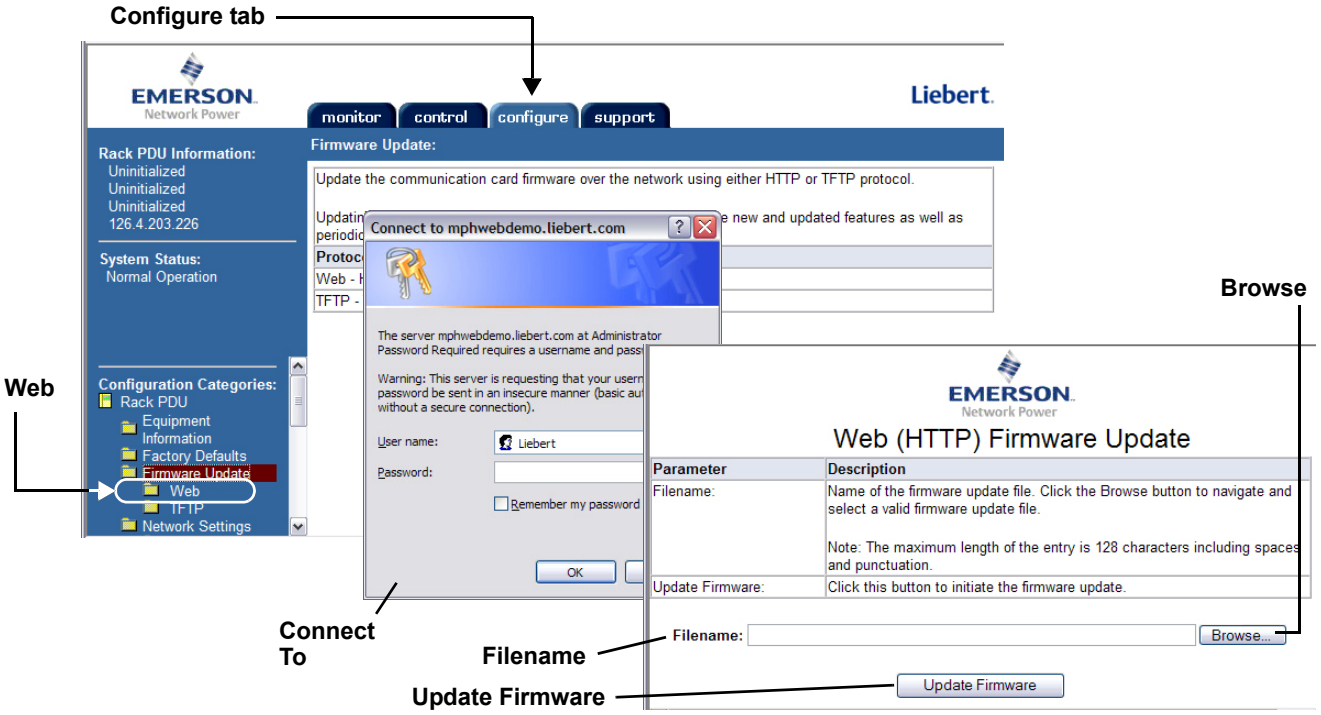
13.6 Updating the Firmware - Web (HTTP) Method

Follow these steps to install the firmware upgrade using the Web (HTTP) method. This method is available through the Web interface with an Ethernet connection to the Liebert RPC.

NOTE
Turn off the power management on your PC or laptop before beginning the update to ensure that communication will not be disrupted during the process.

To update the Liebert RPC firmware using the Web (HTTP) method:

1. Open a connection to the Liebert RPC (if needed, see instructions in **13.4 - Connect to the Card and Open the Web Interface**).
2. Click on the **Configure** tab, then click on **Web** (under **Firmware Update**) in the left pane.
3. The Connect To box, below center, opens with a prompt to enter the Administrator user name and password (both case-sensitive):
   a. **User Name** (default is *Liebert*)
   b. **Password** (default is *Liebert*)
4. Click **OK**. The Web (HTTP) Firmware Update window opens, shown at right below.



5. Click on the **Browse** button to locate the upgrade file. This is the file with the extension ".epm" downloaded in **13.5.3 - Download the Firmware Upgrade File to the Computer**. Then click **Open** to return to the update screen.
6. When ready to begin the update, click the **Update Firmware** button.
   A screen will appear, showing the firmware update progress.

NOTE
Do not refresh your browser or open another browser window. Wait until the firmware update has been completed before opening other applications or using the computer for other tasks.

7. A message appears indicating whether the update was successful.

After the firmware update is completed, the card will reboot automatically and you may return to the Liebert RPC Web interface.

Check the new firmware version if you wish (see **13.5.2 - Determine the Firmware Version**).

13.7 Updating the Firmware - TFTP Method

Follow these steps to update the firmware using the TFTP method. This method is available through the Web interface with an Ethernet connection to the Liebert RPC.

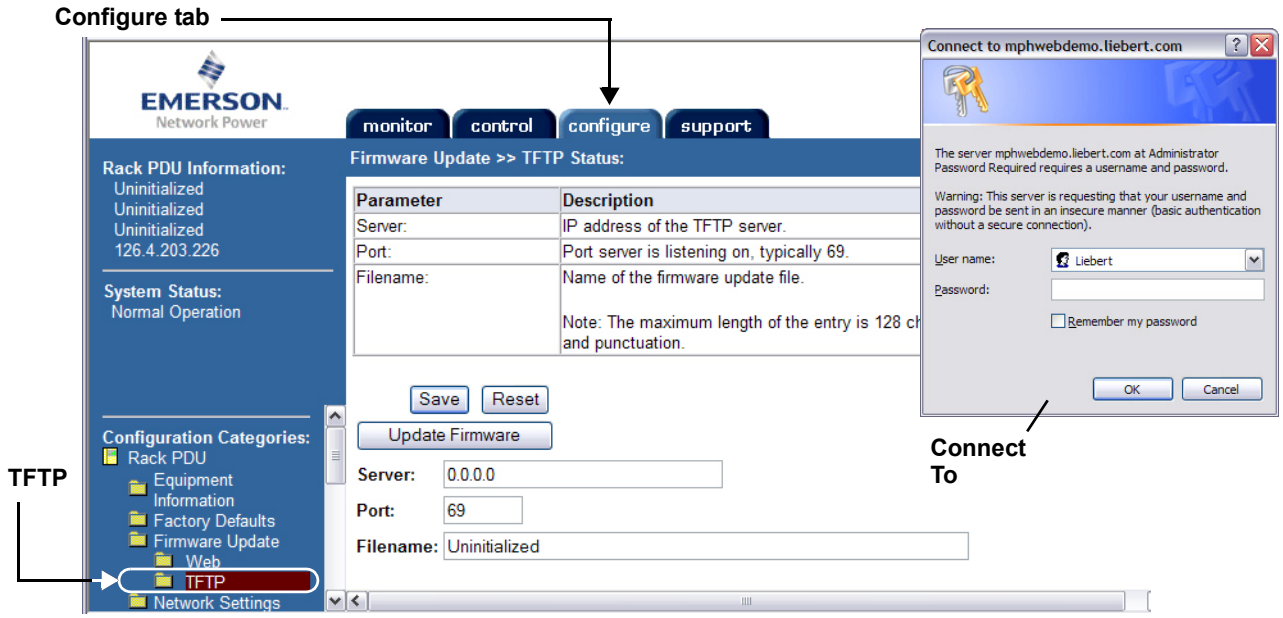
NOTE

*This method includes a time-sensitive operation requiring expeditious location of the upgrade files downloaded in **13.5.3 - Download the Firmware Upgrade File to the Computer**. Read through this entire section before beginning the upgrade.*

To update the Liebert RPC firmware using the TFTP method:

Open a Connection to the Card

1. Open a connection to the Liebert RPC (if needed, see instructions in **13.4 - Connect to the Card and Open the Web Interface**).
2. Click on the **Configure** tab, then **TFTP** (under **Firmware Update**) in the left pane.



3. The Connect To box, above right, opens with a prompt to enter the Administrator user name and password (both case-sensitive):
   a. **User name** (default is *Liebert*)
   b. **Password** (default is *Liebert*)

Specify TFTP Server and Upgrade Filename and Reboot the Card

4. Click the **Edit** button in the right pane.
5. Select options as needed and refer to the following guide to change any settings.

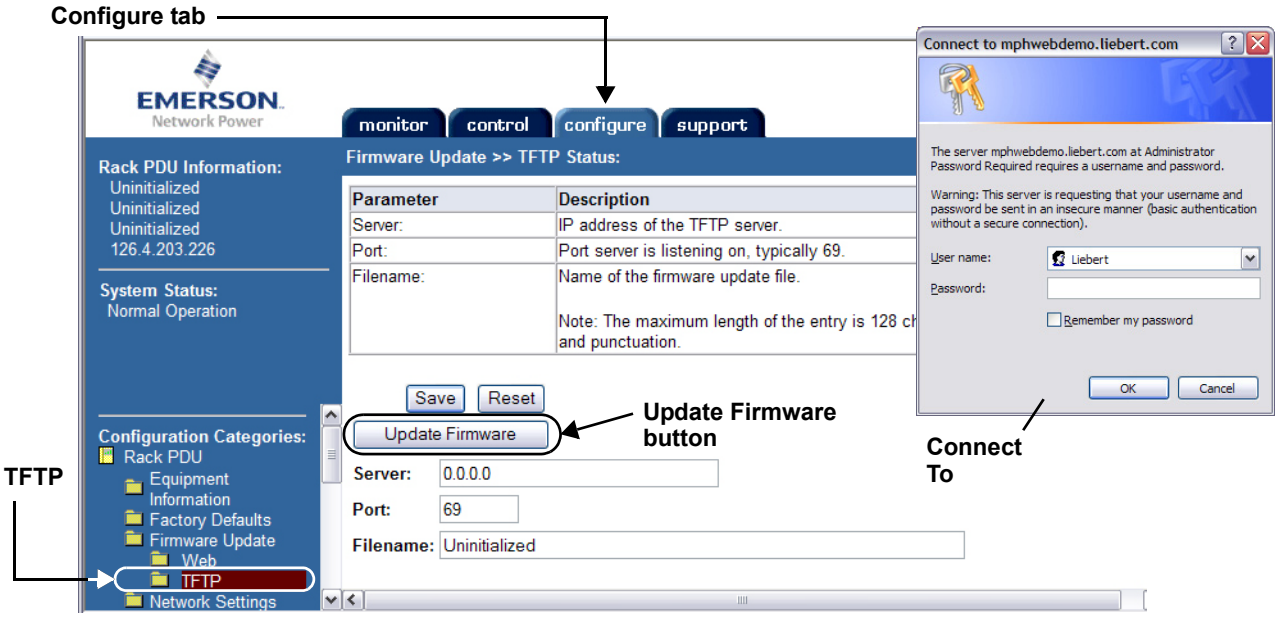
Table 54 Firmware update settings - Web

Parameter	Description
Server	The IP address of the TFTP server—for example, **192.168.0.125**.
Port	Port that the TFTP server is using, typically **69**.
Filename	Name of the firmware update file—128 characters maximum, including spaces and punctuation. This is the file with the extension "**.epm**" downloaded in **13.5.3 - Download the Firmware Upgrade File to the Computer**.

6. After making changes, click **Save**, then click **Restart** in the left pane to reboot the card.

Reconnect to the Card and Begin the Upgrade Process

7. Repeat **Steps 1** to **3** to return to the TFTP screen: Open a connection to the Liebert RPC, click the **Configure** tab, then **TFTP** and finally enter the user name and password.
8. Open the TFTP application and start TFTP. Ensure that all settings are ready to transfer the file, including the location of the upgrade file. Refer to your TFTP user manual for more details.
9. Return to the Web interface.
10. When ready to begin the download, click the **Update Firmware** button, shown below.

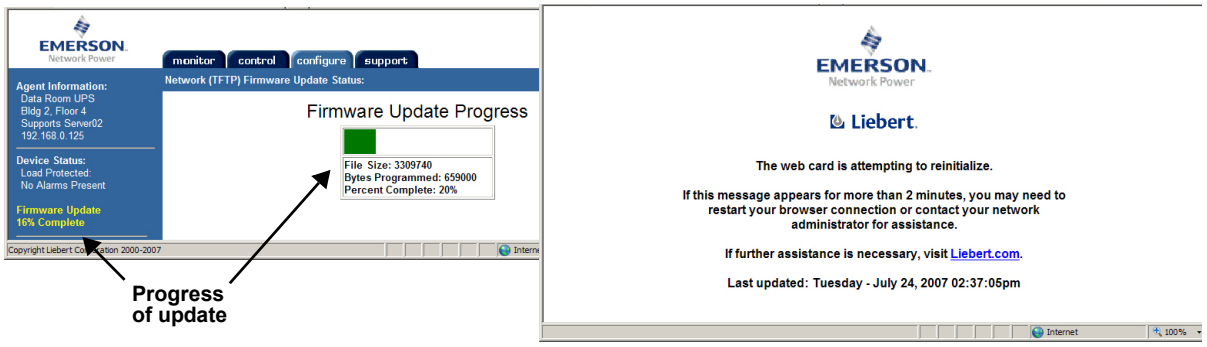


11. During the update, the window displays a progress bar, as shown below left.

NOTE

Do not close the Web browser during this process or the update will abort.

After the firmware update is completed, the card will reboot automatically. A message appears, as shown below right, and remains until the rebooting is finished.



When the rebooting is complete, the Web browser window returns to the default opening view. The upgrade is now complete.

Check the new firmware version if you wish (see **13.5.2 - Determine the Firmware Version**).

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